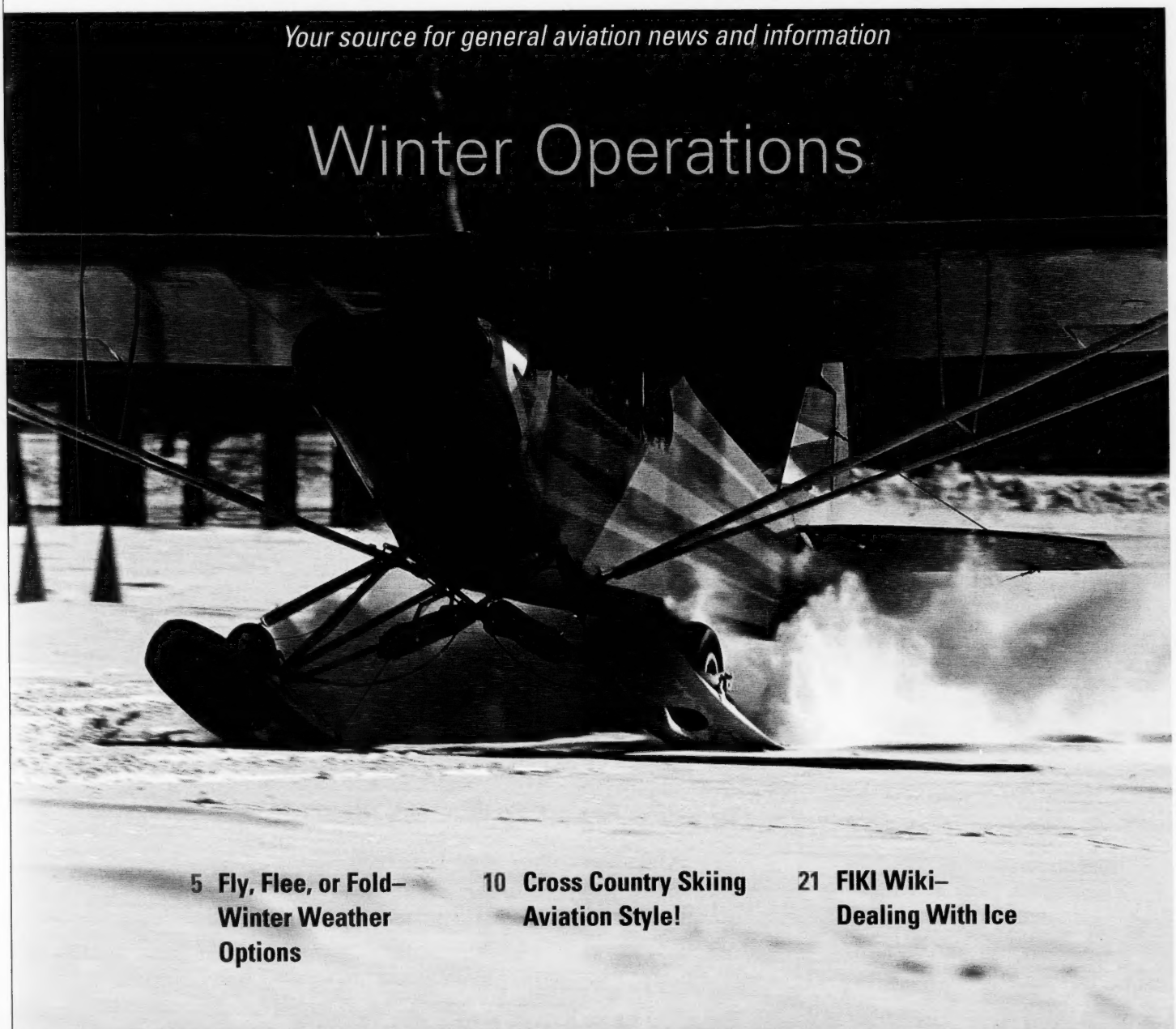
FAA Safety BRIEFING

November/December 2014

Your source for general aviation news and information



Winter Operations

5 **Fly, Flee, or Fold– Winter Weather Options**

10 **Cross Country Skiing Aviation Style!**

21 **FIKI Wiki– Dealing With Ice**

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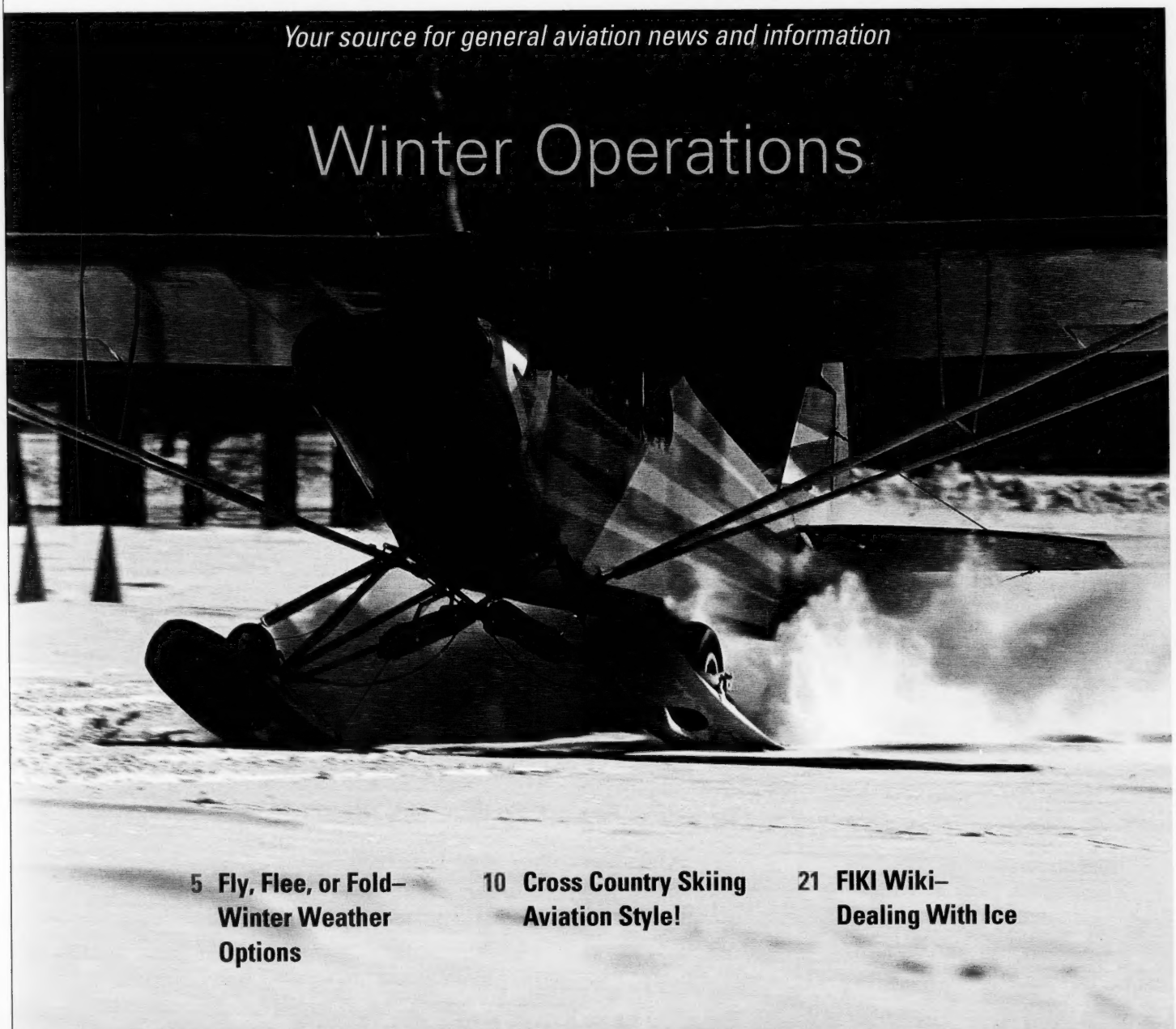

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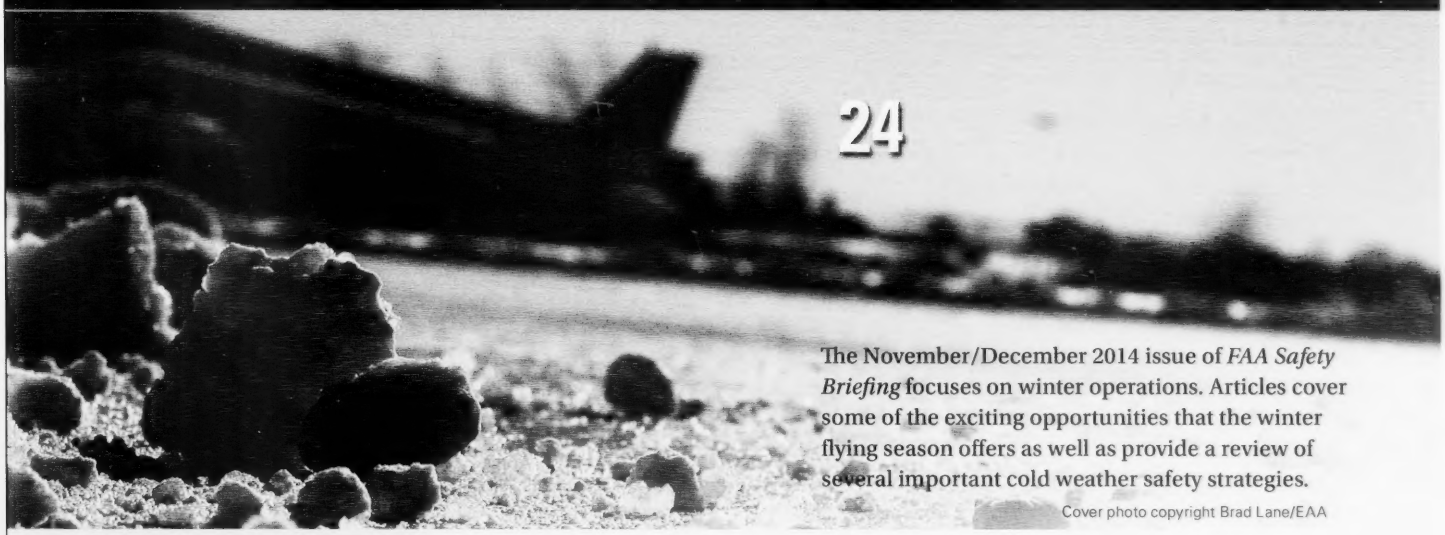

The November/December 2014 issue of *FAA Safety Briefing* focuses on winter operations. Articles cover some of the exciting opportunities that the winter flying season offers as well as provide a review of several important cold weather safety strategies.

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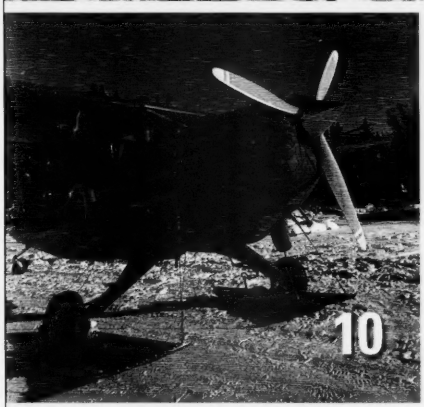

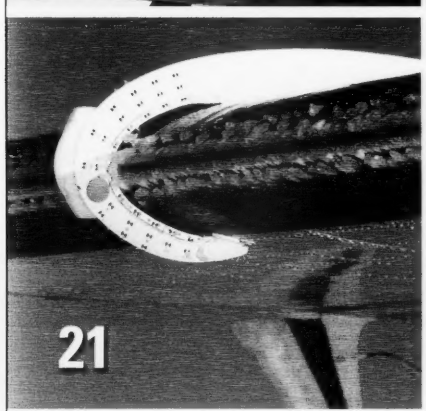

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JOHN DUNCAN
DIRECTOR, FLIGHT STANDARDS SERVICE

Winter Weather Wisdom

In a lifetime of aviating, which has always included a healthy dose of GA flying, I've encountered all kinds of weather. People who know that I lived in Alaska assume it must have required extraordinary preparations to operate in that environment. In fact, winter flying in Alaska did not require much that doesn't apply to cold weather operations pretty much anywhere when the mercury dips below a certain level. Flying in the forty-ninth state just meant applying those measures more, and more often, and more conscientiously.

My airplanes and I now live in the more temperate climate of northern Virginia but, believe me, it still gets cold enough to keep in practice on winter flying procedures and precautions. Articles in this issue of *FAA Safety Briefing* touch on some of them. But let me get the snowball rolling by sharing my top three tips for cold weather operations in the GA environment.

Fashion for Frosty Conditions

Let's start with the pilot. As Sabrina Woods explains in her "Chilled to the Bone" article later in this issue, low temperatures affect human performance in all kinds of ways. You'll learn a lot from her findings on this topic, and it's okay if it makes you decide that indoor activities are a better idea on particularly cold days.

If you do decide to fly, proper clothing is essential. A thorough preflight inspection inevitably increases the pilot's cold exposure, so that's one reason. Another is that everyone on board needs to be dressed to survive a more extended cold weather exposure in the event of an off-airport landing. Challenging terrain and sparse population density strongly reinforced that point when I flew in Alaska, but it still applies in Virginia, and on some of the routes I fly to visit family in Ohio. Attentive GA pilots quickly develop an appreciation for the openness of this country, and I'm sure you've noticed the tremendous amount of unoccupied land even in otherwise congested areas. If you had to make an off-field landing, chances are good that you'd be aiming for some of that open space — and you and your companions will be grateful for warm clothing while you wait for assistance.

Even if the flight is normal, GA aircraft heaters are not always as effective as we'd like. You'll appreciate warm clothing in those circumstances as well, and your attention can devoted to aviation tasks rather than to thinking about how cold you are.

Preheat — More than a Good Idea

There's also a lot of information on getting your airplane ready to fly on a cold winter day in free FAASTeam publications such as "Winter Flying Tips" (P-8740-24), available at www.faasafety.gov. This pamphlet stresses the importance of preheating your airplane's engine. Preheat reduces the risk of engine fires from over-priming during attempts to start a cold-soaked engine, which is the subject of this issue's "Checklist" department. Preheat also preserves and extends the life of your engine, whose many moving parts and multiple metals don't mesh together very well when everything is cold. If you take good care of your airplane and its engine, your airplane and its engine will reciprocate (so to speak) by taking good care of you. The modest cost of hangar space or preheat services is well worth it.

An Icing Escape Plan

Even if you fly a GA airplane approved for flight into known icing conditions (FIKI), please don't even think of going aloft in the winter without having a pretty good idea of where the ice is (so you can avoid it), and where the ice isn't (so you can plan your escape). There are numerous online tools these days (e.g., through the NWS ADDS website) that offer very detailed information on the location and altitudes for possible icing conditions. The technology isn't good enough (yet) to be more than advisory, but it still provides a lot more information than we GA pilots used to have.

In addition to using these tools and inflight weather updates for weather information, make it a rule to *always* know the freezing level, and to avoid flying in visible moisture at or above freezing temperatures. For escape purposes, you'll also want to know the nearest above-freezing altitude and, of course, plan so that you can fly in those warmer temperatures without hitting terrain or other obstacles.

Finally, remember that Mother Nature doesn't read the weather forecasts. At least twice in my flying career, including one flight in the vicinity of virga, I have been surprised by ice that wasn't supposed to be where I was. But I had (and exercised) a plan to go elsewhere.

With proper preparation, winter flying can be great. Enjoy!

FAA Streamlines Aircraft Certification Process

As part of ongoing efforts to improve responsiveness to the aviation industry as it certificates new products and operators, the FAA took an important step in September to streamline the aircraft certification process to help the industry get products to market faster and retain competitiveness.

The FAA is replacing project sequencing with a new process to prioritize all U.S. aircraft certification projects. While the new process continues to use a project's safety benefit and complexity to prioritize and allocate resources, it now offers applicants increased predictability and a commitment to a response time for the review of the applicant's compliance data. The time it takes for certification depends on the complexity of the project and the experience of the company. Once an application package has been accepted, applicants will be able to initiate projects without delay; particularly if they have an Organization Designation Authorization or are using FAA-approved individual delegated engineering representatives.

This new process responds to the recommendations from the Aircraft Certification Process Review and Reform Aviation Rulemaking Committee formed in accordance with Section 312 of the FAA Modernization and Reform Act of 2012.

Last year, the FAA certificated approximately 10,000 aviation products. There is currently no backlog or queue for certification projects.

Photo courtesy of Cessna Aircraft

Helicopter Safety Effort

The FAA Rotorcraft Directorate is seeking comments from helicopter pilots, mechanics, flight safety officers, and others associated with personal/private, instructional/training, and aerial application industries about what you would like to see in a safety forum.

The directorate will host a three-day safety forum April 21-23, 2015, in Hurst, Texas. The forum's purpose is to discuss ways to improve flight safety, particularly among personal/private, instructional/training, and aerial application industries. These three industries have consistently high accident rates. Before planning the forum, the FAA wants to know what lectures, displays, events, and programs would encourage you to attend. What topics do you think would be of the most value, and what forums have you attended that you particularly liked and why?

Please contact Eugene Trainor directly at eugene.trainor@faa.gov to submit your comments.

Bird Strikes

The FAA, in cooperation with the U. S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS), Wildlife Services, have published their latest annual report on wildlife strikes to civil aircraft. This report, posted last July, includes data from 1990 to 2013. The report states that strike rates per 100,000 movements have increased in general aviation operations, from 0.69 in 2000, to 1.20 in 2013. Damaging strikes for GA have fluctuated between 0.18 in 2006 and 0.29 in 2013.

The report also revealed that most bird strikes (52 percent) occurred between July and October, which is when birds are migrating and populations are at their annual peak following the nesting season. Sixty-two percent of total bird strikes occurred during the day and 30 percent at night. Almost twice as many strikes (61 percent of total) occurred during the landing (descent, approach, or landing roll) phase of flight compared to 35 percent during takeoff run and climb. The timing for terrestrial mammal strikes was similar, with a majority taking place between July and November. Thirty percent of all deer strikes occurred between October and November. To view the latest annual bird strike report online, go to http://1.usa.gov/1sCfjOK.

Celebrate Aviation History Month

Did you know November is Aviation History Month? It's a great time to celebrate some of the remarkable achievements and advancements made in flight here in the United States. It's also a great time to go visit one of the many aviation museums around the country. There are hidden gems all over the country! What's your favorite aviation museum or historical marker? Send us a tweet at @FAASafetyBrief so we can share with everyone in the general aviation community.

USHST Looking for More Experts

The United States Helicopter Safety Team (www.USHST.org) is calling for more helicopter safety experts to join their productive efforts to reduce accidents and fatalities in the industry.

The implementation committee of the USHST consists of members from industry and government who are focused on safety management, training, maintenance, and safety technology. They work together to develop educational support documents such as safety toolkits, safety bulletins, and essays to improve and increase safe helicopter operational practices. They also work on enhancing standard practices and requirements within the civil helicopter industry.

To date, USHST experts have created and distributed 18 safety bulletins for helicopter operators that concentrate on topics such as visibility, loss of control, controlled flight into terrain (CFIT), autorotations, training, safety management, and hazard identification.

Safety experts from the following organizations have participated in USHST efforts: Air Methods, Bell Helicopter, Boeing Company, Bristow Academy, CAE/Flightscape, Dallas Police Dept., Embry-Riddle Aeronautical Univ., FAA, Helicopter Association International, Life Flight of Maine, NTSB, Prism Helicopters, Robinson Helicopter Co., Sikorsky Aircraft, and SkyTrac Systems.

For information and criteria on how a helicopter safety expert can join the USHST effort, contact Steve Sparks via email at steven.sparks@faa.gov.

NTSB Notes Decline in GA Accident Rates in 2013

Last September the National Transportation Safety Board (NTSB) released preliminary aviation accident statistics indicating an overall decline in the number of U.S. registered civil aviation accidents. The number of civil aviation accidents fell from 1,539 in 2012 to 1,297 in 2013.

With regard to general aviation accidents, the NTSB determined there was a decrease in all measures. The total number of general aviation accidents decreased by 249 in 2013, bringing the number to

Photo by Mark Colborn

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of Transportation

**Federal Aviation
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Margaret Gilligan *Associate Administrator for Aviation Safety*
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James Viola *Manager, General Aviation and Commercial Division*
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Sabrina Woods *Assistant Editor*
Paul Cianciolo *Assistant Editor*
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Comments or questions should be directed to the staff by:

- Emailing: SafetyBriefing@faa.gov
- Writing: Editor, *FAA Safety Briefing*, Federal Aviation Administration, AFS-805, 800 Independence Avenue, SW, Washington, DC 20591
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1,222. The number of fatal accidents (221), fatalities (387) and the accident rate per 100,000 flight hours (5.85) also declined from the previous year.

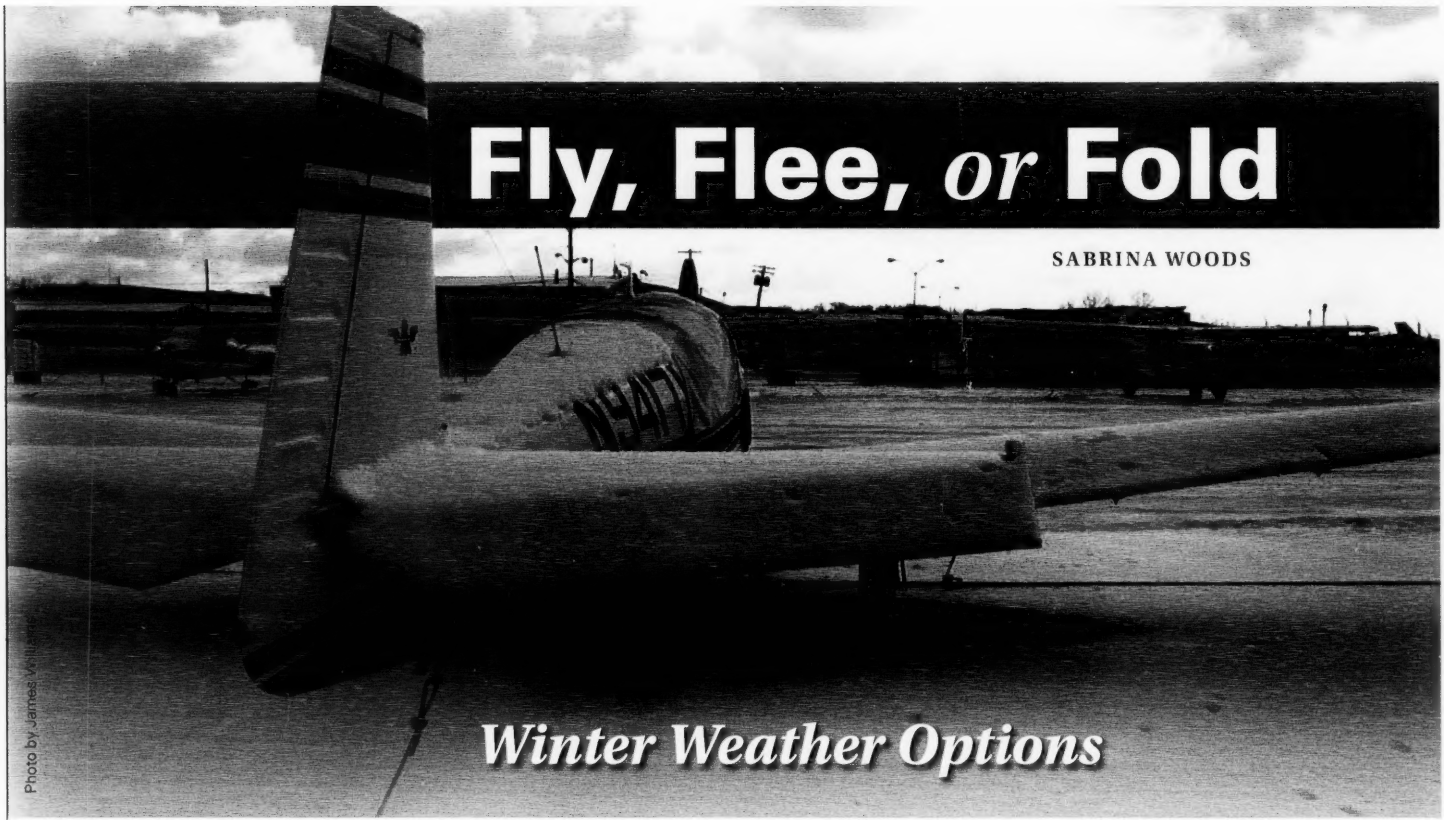
To view the 2013 statistical tables showing accidents, fatalities, and accident rates for major segments of U.S. civil aviation, go to http://go.usa.gov/paX5.

For the fiscal year 2014, the FAA reported having met all three of its performance targets for general aviation, commercial, and worldwide accident rates. The GA target, which was set to reduce the fatal accident rate per 100,000 flight hours by 10 percent over a 10-year period (2009-2018), ended FY14 with 250 accidents. This is one below its not-to-exceed year-to-date target of 251 fatal accidents.

New AC for Runway Overrun Risks

Runway overruns during the landing phase of flight account for approximately 10 incidents or accidents every year with varying degrees of severity, with many accidents resulting in fatalities. Advisory Circular (AC) 91-79A, *Mitigating the Risks of a Runway Overrun Upon Landing*, provides ways for pilots and airplane operators to identify, understand, and mitigate risks associated with runway overruns during the landing phase of flight. The AC revises a previous runway overrun AC to include current and comprehensive guidance on the risks associated with tailwind landings and landings on wet or contaminated runways. It also provides detailed information that operators may use to develop company standard operating procedures to mitigate those risks. Download the AC at http://1.usa.gov/Xw32P7.

Photo by Tom Hoffmann



Fly, Flee, *or* Fold

Winter Weather Options

SABRINA WOODS

Photo by James Williams

As the last few leaves depart the trees and the air turns cold and crisp, every aircraft owner is faced with the same decision: to fly, flee, or fold up shop. The choice is often a difficult one with so many different factors to be taken into consideration, but here are some quick tips to consider that might help out your "go/no-go" process.

Fly

Congrats! You have decided to become one of those derring-do folks who scoff at the falling mercury and take to the skies in order to seek the freedom that can come with less crowded airways, clearer skies, and, quite often, better aircraft performance. But how do you prepare for flying in this winter bliss?

First and foremost, make sure you are physically prepped and ready to undertake flying in colder temperatures. To read more about how cold stress affects your personal performance, check out "Chilled to the Bone" in this edition of *FAA Safety Briefing*. The short version is that you need to keep your core temperature humming at, or very near to, 98.6 degrees. This means eating right, getting plenty of rest, dressing for the cold, and limiting exposure to the elements.

For your aircraft, winter ops will mean injecting things like de-icing and anti-icing into your normal regime. It might be your inclination to rush through your pre-flight inspection — after all, it's *cold* outside — but this is the time to be even more meticulous when scrutinizing your aircraft for issues. In particular, take extra-special care in your preheating process to avoid cold starts, engine damage, or fire. Be realistic in what you are asking for — is it within your aircraft's capability? Better check the manual.

When taxiing, the name of the game is "nice and slow" because if you weren't able to walk very steadily on the ice-coated surfaces leading out to your parking space, it is entirely likely that your 1,200-pound Piper *Cub* won't fare much better. Once you have taken to the air, remember that winter weather is rather notorious for changing quickly. Weather and radar apps are your best friends. So is filing a flightplan, having a "plan B," and carrying an ELT on board. Keeping night and instrument current is also a smart idea as the days tends to be shorter and visibility varies greatly.

Once you are back on the ground, chocked in, and ready to button 'er up for the night, clean off any salt that may have collected on the flight surfaces or windshield, and if applicable, refill the deicing fluid (you can never have enough of that stuff!). Engine, oil cooler, air inlet, wing, and prop covers go a long way in keeping your aircraft snug as a Cub in a rug.

Flee

You want to keep flying but you have had *enough* of this winter weather. So you pack up your pride and joy and take off for more temperate ter-

ritories. Good on you, but here is what you need to know before you go.

If this is your first time heading south for the winter, you will want to research a new nest for your bird well in advance of actually moving it. Several aviation industry websites such as www.flightaware.com, www.aopa.org, and www.jeppesen.com, will offer reviews of different fixed-base operators. Some things to consider are: What type of aviation fuel is provided and at what price (always important!)? Is the staff courteous and professional? Are maintenance technicians on hand and if so, are they knowledgeable about your aircraft type? Do they have adequate tools and equipment? Are the facilities reasonably clean and up-to-date? And lastly, how are aircraft maneuvered in and around the hangars and parking areas? Are they easily-accessible, and if so, at what times of the day?

Next, check with whoever insures your aircraft to make sure your coverage allows you to fly in an area in which you want to temporarily relocate. Quite often insurance is based on the state so if you are moving your aircraft from Montana to New Mexico, there might be some new stipulations.

Benjamin Franklin once penned "in this world nothing can be said to be certain, except death and taxes." If you bounce between residences in two different states you'll want to research how each address (and therefore each state) might expect to tax your personal property. Some states have registration fees, and other states have *both* a personal property and a registration fee. Check out the Aircraft Owners and Pilots Association's pilot guide to taxes (http://www.aopa.org/Pilot-Resources/Aircraft-Ownership/The-Pilots-Guide-to-Taxes). Doing so will make sure you are informed prior to relocating.

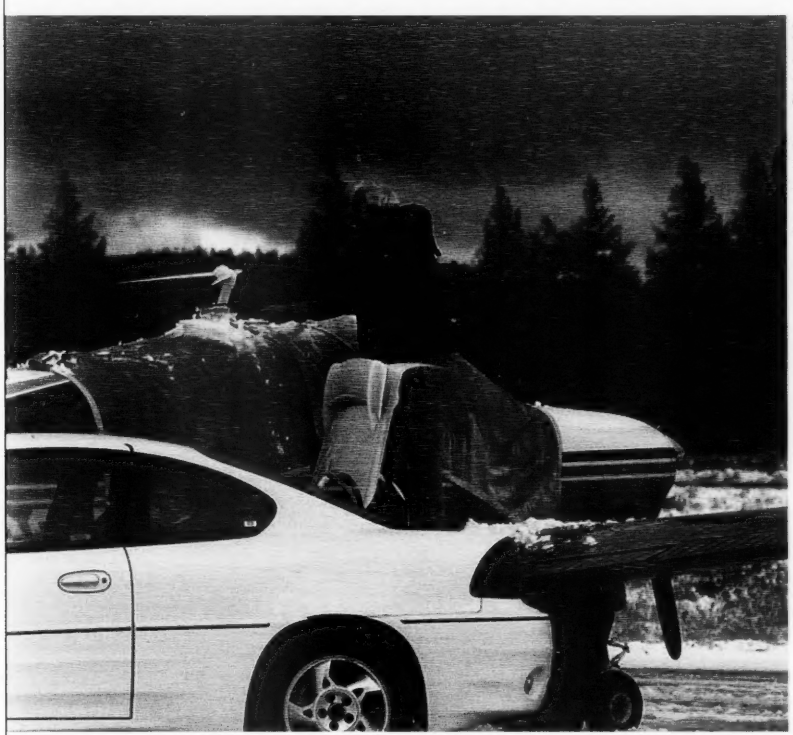


Photo by H. Dean Chamberlain

Fold (Up Shop)

You've decided that winter is good for so many things — football, holiday parties, baked treats, and snow days — but flying just isn't one of them. No worries here. Many aircraft owners choose to "hunker down" instead of fighting the falling temps.

First, prior to the long winter's rest, you should give your aircraft a good wash down and clean out. Then, even if your aircraft is hangared, you will still want to plug and cover up all of the access ports, the pitot tube, engine cowlings — hide all of the nooks and crannies so an opportunistic animal can't seek refuge.

Place shields over the windows and on props, and cover up the wings and horizontal tail — in particular if the aircraft is stored outside. Many owners are fond of giving the entire airframe a good grease-down to discourage metal to metal contact and to provide an extra level of protection against the elements. Last, release the pressure on the parking brake AFTER chocking the tires, and consider removing the battery to prevent drainage.

When it comes to "pickling" your engine, you will want to refer to the manufacturer's guidelines on temporary and long-term storage. Moisture is your enemy and I guarantee that every recommendation will be in an effort to keep your motor dry and corrosion free. Among other things the manual will address is how to: top off fuel and drain the water from it, re-service the oil (adding preservative oil is best) and hydraulics, and install desiccant plugs to control the humidity.

So there you have it; a quick down and dirty as to your three winter weather options. Each has its own special considerations, and hopefully this article gave you a little more insight as to which option might be right for you. Fly, flee, or fold — it is your choice!

Sabrina Woods is an assistant editor for FAA Safety Briefing. *She spent 12 years as an aircraft maintenance officer and an aviation mishap investigator in the Air Force.*

JAMES FRASER, M.D
FEDERAL AIR SURGEON

Aeromedical Advisory:

The Most Wonderful Time of the Year (or Maybe Not)

As the days get shorter and the holiday season approaches, not every person is filled with joy. The holiday season can be one of the most stressful times of the year for many people, and that, in turn, can lead to the abuse of drugs and alcohol.

As the Federal Air Surgeon, one of my lesser known responsibilities is running the FAA's drug testing program for FAA employees and industry aviation professionals. Since Congress mandated drug and alcohol testing of many aviation professionals in 14 Code of Federal Regulations (14 CFR) part 121 and 135 operators, roughly 2,000 individuals per year have failed a DOT drug test. That number has been stubbornly stable through the years. While we don't have the statutory authority to randomly test GA pilots, forensic toxicology tests after accidents show a similar use pattern. As pilots are a microcosm of society, this is not entirely surprising.

What the Data Says

Recently, our Civil Aerospace Medical Institute (CAMI) conducted a review of all fatal GA accidents between 2000 and 2013. Of the total 3,756 fatal accidents during the period, CAMI found that 976, or nearly 26 percent of the total, were positive for disqualifying medications, drugs of abuse, alcohol, or some combination of the above. While I discussed some of the disqualifying medications in a previous column, in this issue I'd like to focus on the other categories. Drug abuse was detected in 202 accidents and alcohol was present in 115 accidents. There is some overlap, as some people tested positive for multiple substances. CAMI also provided data to the National Transportation Safety Board (NTSB) for a longer term study that focused on over-the-counter (OTC), prescription, and illicit drugs for the period between 1990 and 2012. This study found that of the 6,677 pilots who died in aircraft accidents during the study period, the percentage of pilots testing positive for potentially impairing drugs more than doubled — from 11 percent to 23 percent.

What Can We Do?

The first step is to give potentially impairing substances plenty of time to clear your system before you consider flying. In the case of alcohol, that means that you should stop drinking sometime between 12 and 24 hours before your flight. While the regulation may only require eight hours, that might not be enough time for it to completely clear your system. Remember that being "hung-over" can still be impaired.

In terms of drugs, there's no concern that a poppy seed bagel or sesame seed roll will get you flagged in a drug test. The test thresholds are specifically designed to avoid such false positives. Remember that drugs can often impair your higher order thinking while leaving you feeling as if you're fine. This is especially dangerous, because you don't necessarily perceive how impaired you actually are.

Remember that being "hung-over" can still be impaired.

Just because you have or have had a prescription for a drug doesn't mean it's okay to use that medication before or during a flight. If you have questions, please contact your AME. If you find yourself feeling that you need drugs or alcohol to complete a flight or get through a stressful situation, you might need help.

What if I Need Help?

Our culture of self-reliance in aviation can sometimes be an impediment to healthy flying. If you feel like you need help, please talk to your doctor or another health care professional. If you're having trouble finding help, please visit the Substance Abuse and Mental Health Services Administration at: www.samhsa.gov/treatment/or call 1-800-662-HELP (4357). Asking for help when you need it is an important part of safe flying. Just like we train our airline pilots in crew resource management to use all available resources, we should do the same in dealing with our health. The life you end up saving might not just be your own, but those of your family members as well.

James Fraser received a B.A., M.D., and M.P.H. from the University of Oklahoma. He completed a thirty year Navy career and retired as a Captain (O6) in January 2004. He is certified in the specialties of Preventive Medicine (Aerospace Medicine) and Family Practice. He is a Fellow of the Aerospace Medical Association and the American Academy of Family Practice.

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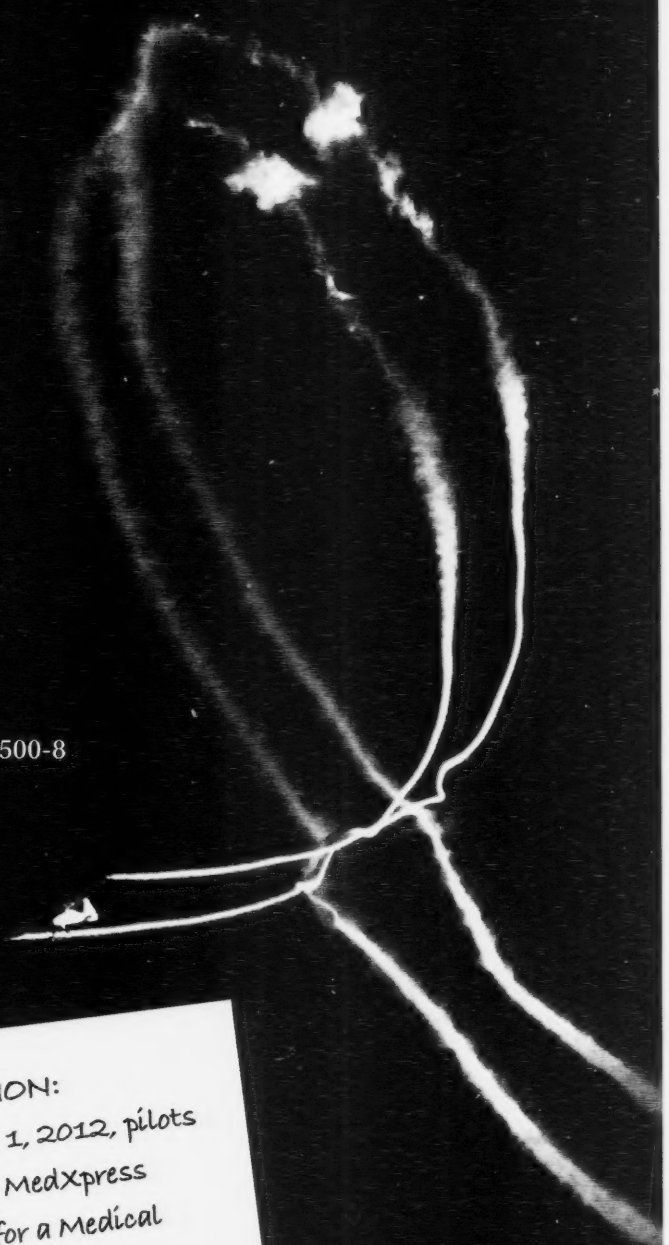
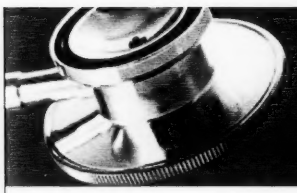
With this online option you can complete FAA Form 8500-8 in the privacy and comfort of your home and submit it before your appointment.

The service is free and can be found at:

https://medxpress.faa.gov/



ATTENTION:
As of Oct. 1, 2012, pilots must use MedXpress to apply for a Medical Certificate.



Ask Medical Certification

COURTNEY SCOTT, D.O.
MANAGER, AEROSPACE MEDICAL
CERTIFICATION DIVISION

Q1. I am on Cladribine and Rituxan to treat my Non-Hodgkin's lymphoma. I have had absolutely no issues or side effects at all. After I was off treatment for three months, I received my special issuance second class medical. It is my understanding, though, that if I should have to go back on Rituxan, I would be allowed to fly again after being off for three days.

In addition, my oncologist said he has heard about new clinical trials, and he thinks I would be a great candidate. I asked what drugs would be involved and he didn't know. I asked if it would have any side effects, and he said he doubted it. It would be a daily pill like aspirin. If I were to participate, how would it affect my special issuance? Could I continue to fly as long as I do not see that it is having any effect on my capability to act as PIC?

A1. Provided that the disease itself is stable, it would be permissible to resume treatment with Rituxan. There are some warnings that go with that medication. With regard to drugs used in clinical trials, I have to be pessimistic regarding flying. The FAA requires an absolute minimum one year after the FDA approves a new medication before we will consider it. This would preclude the clinical trial. It is important to emphasize, however, that one's health should always be the most important factor in making these kinds of decisions.

Q2. My friend is interested in flying and wants to start taking lessons. He asked me if he could earn a private pilot certificate and pass the medical with the pacemaker he has had for around ten years. Is it possible, or should I advise him to forget it?

A2. If all medical criteria are met, the FAA has been approving special issuance medical certificates for permanent pacemakers for more than 20 years. This includes all classes of medical certificates. There are two important caveats, however; current policy stipulates that pacemaker dependency is prohibited for first or second class medical certificates. Also, many pacemakers today have an implantable cardiac defibrillator included. These pacemakers are prohibited.

Q3. In September 2012, I let my third class medical lapse while I sorted out the reasons for elevated blood pressure, which was identified simply during a couple workups for routine exams with my PCP and gastroenterologist. I found a cardiologist and went through an entire battery of diagnostic tests, and was deemed safe to fly with no foreseeable problems of a cardiac nature for 10 years into the future. I now take a single 40 mg tablet of Benecar daily. This controls my blood pressure. I also run 2.5 miles regularly and do not smoke or drink alcohol. I've decided to go back and get my third class medical, and would like to know what to expect from my medical examiner.

A3. Well-controlled hypertension is now considered a condition that your AME can certify. You should provide evidence that your hypertension is well controlled, such as a series of three daily blood pressure checks, and a note from your treating physician that discusses your treatment regimen and whether or not you have any side effects.

Send your questions to SafetyBriefing@faa.gov. We'll forward them to the Aerospace Medical Certification Division without your name and publish the answer in an upcoming issue.

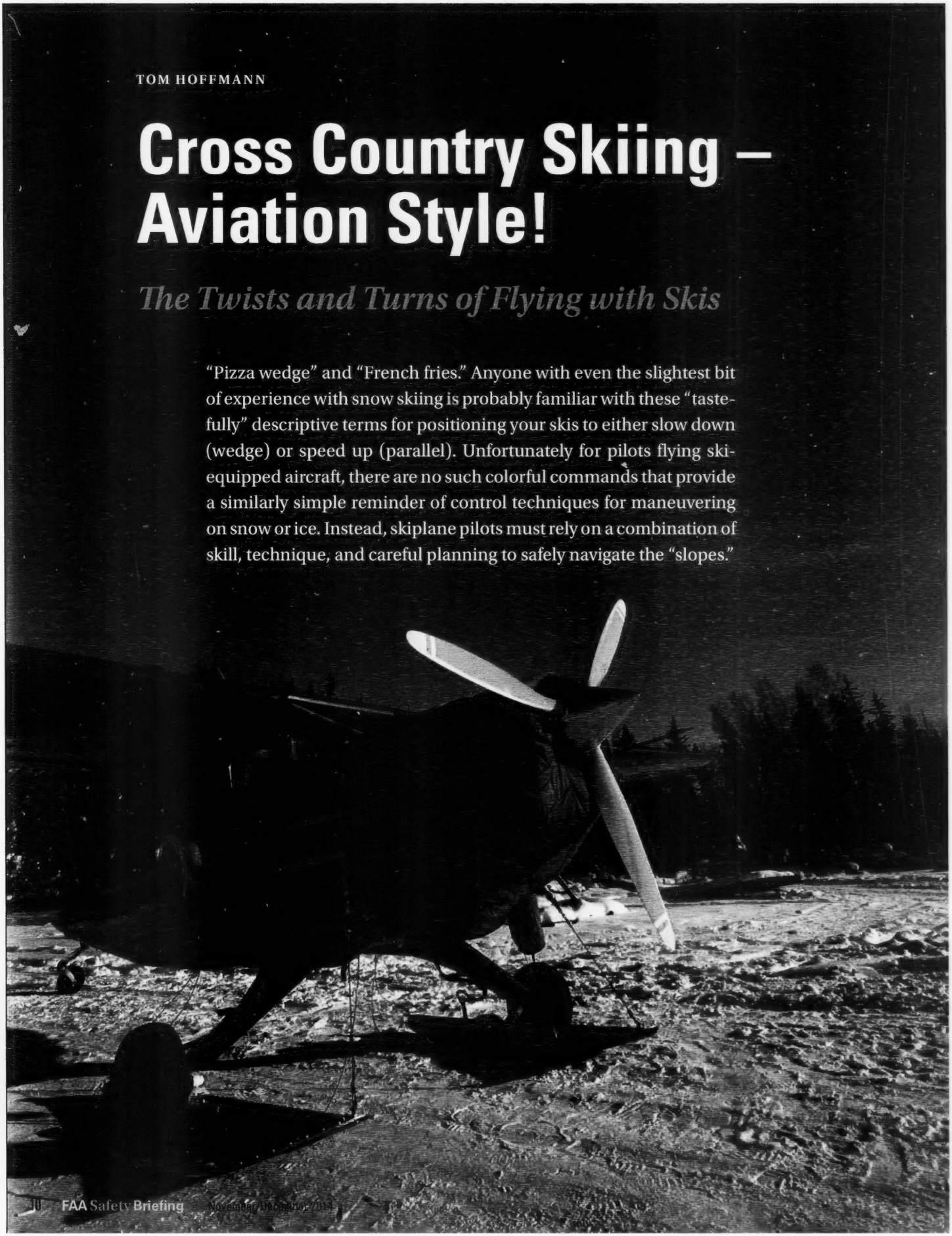
Courtney Scott, D.O., M.P.H., is the Manager of Aerospace Medical Certification Division in Oklahoma City, Okla. He is board certified in aerospace medicine and has extensive practice experience in civilian and both military and non-military government settings.

TOM HOFFMANN

Cross Country Skiing – Aviation Style!

The Twists and Turns of Flying with Skis

"Pizza wedge" and "French fries." Anyone with even the slightest bit of experience with snow skiing is probably familiar with these "tastefully" descriptive terms for positioning your skis to either slow down (wedge) or speed up (parallel). Unfortunately for pilots flying ski-equipped aircraft, there are no such colorful commands that provide a similarly simple reminder of control techniques for maneuvering on snow or ice. Instead, skiplane pilots must rely on a combination of skill, technique, and careful planning to safely navigate the "slopes."



No rating is required to operate a skiplane, but be aware that the learning curve is probably a bit steeper than your average bunny slope. If you are already knee-deep in winter weather this year, or perhaps inspired by the freedom and exploration opportunities that only skiplane flying can offer, then read on — this article will help you get on your way to safely enjoying this exciting niche of frosty flying.

Pick Up Your Skis Here

When you choose your own skis, several factors can influence what type you pick (style of skiing, environment, cost, etc.). The same is true for selecting skis for an airplane. However, despite the many variations in materials and design, there are only two basic categories of skis: plain and combination. Both can be used on ice and snow, but combination skis allow pilots the added benefit of using tires for a runway landing.

Plain skis come in three flavors. Wheel replacement skis are just that — skis in place of wheels. Clamp-on skis attach to the tires and, as a result, provide a little extra cushion on landing. Finally, roll-on or full-board skis are similar to clamp-ons, except that the tires are bypassed and do not carry any side or torque loads.

Combination skis have two main variations: retractable and penetration. Retractable skis have either a hydraulic pump or crank that allows pilots to extend or retract skis as needed. Penetration skis have a more permanent arrangement whereby the tires extend partially below the ski through a cut-out. Penetration skis might be a more economical option for some, but they generally provide poor ground clearance on non-snow surfaces and can add drag on snow.

There's also the possibility of adding a tailwheel ski, which, depending on your conditions, can either hamper or enhance operation. For takeoff or taxiing on deep snow, tailwheel skis can make turning easier and can help prevent the tail from sinking into the snow. On the flip side, the additional drag of a traditional tailwheel (without a ski) can aid in a shorter distance stop and keep the airplane going straight on a snow landing. Bottom line: Whether you're a seasoned aviator or a novice-in-training, buying or renting, it's important to know exactly what type of ski equipment your airplane has, and how the handling characteristics of that equipment could impact your flight planning.

Before You Go

All of this extra gear on your aircraft also means you'll need to adjust your preflight inspection to ensure everything is up to snuff. Start by checking the condition of the skis, especially the sheathing on the bottom which can take an awful beating from rocks and ice. Any significant damage to the surface may require a mechanic to have a look.

Be sure to also inspect any and all shock cord bungees, steel springs, and any hardware attach points. Check the condition of any limiting cables and their fastenings and, if applicable, check tire pressure and the condition of any external hydraulic lines.

Another thing to be mindful of during preflight is stuck skis. "If a shove doesn't move the aircraft easily, the skis may be frozen to the surface," says Anchorage-based FAA aviation safety inspector and skiplane owner Mike Yorke. "Try gently rocking the airplane at the struts to free up the skis, but make sure your skis are free *before* you swing the tail to avoid any damage." To avoid this sticky situation, some pilots prefer to taxi on to a couple two-by-fours or plastic garbage bags. Still others swear by using a little non-stick cooking spray. Who says Pam® is just for frying eggs!

No rating is required to operate a skiplane, but be aware that the learning curve is probably a bit steeper than your average bunny slope.

For a complete list of preflight inspection items associated with skis, refer to the appropriate supplement in your aircraft's pilot operating handbook.

Know Your Snow

Equally important as your preflight inspection is your preflight planning before hitting the slopes. That includes reviewing the proposed route and any available alternates, fuel requirements, available facilities at your destination, weight and balance, and of course, weather. It's also a good idea to consider all of the necessary gear you'll need for an unexpected survival situation. That includes warm clothing and boots (for you and your passengers), water, food, first aid kit, and a means of signaling for help.

Knowledge of the terrain you can expect to find at your destination (and along the way) is another critical part of good preflight. Snow and ice conditions can vary widely and so it's best to find out what kind of conditions you can expect ahead of time. Unless you're headed to a heavily trafficked area, you'll often only have meteorological clues to consider like temperature, dew point, and accumulation reports. When ambient temperatures are low in drier conditions, expect powdery snow. Wet or slushy snow is more prevalent with higher moisture content and warmer temperatures near the freezing point.

The Experimental Aircraft Association hosts an annual Skiplane Fly-In every winter at Wisconsin's Pioneer Airport that showcases dozens of skiplanes like the one pictured here.

Photo copyright Brad Lane/EAA

Both these snow types can lengthen your takeoff run or require you to pack down the snow beforehand with a few passes. It might also cause you to reconsider how much "stuff" you pack in your plane.

Another type of snow — granular — is wet snow that is exposed to a temperature drop, causing the snow to crust over. Similar to what you might encounter during a typical downhill ski run, it's possible a mix of these snow types can exist together and force you to adjust maneuvering techniques on the fly. As a good practice, use all performance data provided by the manufacturer to aid in planning.

Look Ma, No Brakes!

In the air, the only difference you'll likely notice with a skiplane is a reduction in range and cruising speed caused by drag. On the ground is quite a different story. Let's start with taxiing, which becomes somewhat of a balancing act with little or no braking capability. In hard packed snow, directional control is achieved mainly via airflow over the rudder. Turning can be enhanced by adding power and forward elevator. Gusty winds can complicate this process, as skiplanes have a tendency to become giant weathervanes. To compensate, allow the aircraft to weathervane partly during a crosswind taxi. Give yourself plenty of room to maneuver as you'll probably wind up drifting during a turn. Preplanning your taxi track should help you anticipate any tricky spots.

"Keep your taxi speed slow on ice or crusty snow, but on powder, be sure to keep enough power in to keep your skis from sinking," says Yorke. "If you do get stuck, working the elevator and rudder along with a short burst of power should help."

How to Prevent a Yard Sale in the Snow

For those unfamiliar with the term, a "yard sale" is when a skier wipes out on a slope and gear jettisons every which way across the mountain. I've had my share of these, and they can be painful both physically and mentally. Airplanes, however, are not as resilient as humans when face planting in the snow. Hard-to-see snow banks, ice patches, and other inconspicuous wintry hazards can quickly turn a powder smooth takeoff or landing into a yard sale closer to the size of a flea market. Here are a few tips to keep you safe.

As we mentioned earlier, the type and condition of snow or ice you depart from will determine your takeoff run. A good rule of thumb is to add 10 percent, but wet or powder snow may require two to three times the normal distance. Due to the unpredictable nature of field conditions, you'll also want to plan for a soft-field takeoff. In addition, try walking

or taxiing the length of your takeoff path to assess conditions. This practice will serve as an additional means to pack down the snow.

Landings require an equal amount of advanced planning. Off-airport landing sites like glaciers, lakes, and tundra all have unique characteristics you'll want to consider beforehand to ensure that a safe landing (and takeoff) is possible. A good first step is to make a pass over the landing area to get a read on the winds, and check that the landing area is long enough and has sufficient obstacle clearance on both ends. To get an up-close look for hazards and get a better feel for the surface conditions, execute a trial landing, or more colloquially known as "dragging the lake." The *FAA Seaplane, Skiplane, and Float/Ski Equipped Helicopter Operations Handbook* recommends that pilots perform a gentle soft-field touchdown, controlled with power, while remaining near takeoff speed for approximately 600 to 800 feet, and then initiate a go-around. The tracks you leave on your trial landing will also help provide some contrast on your ensuing landing. But, if the ski paths you left in the snow turn black, it means overflow water is present and a landing should not be attempted.

Common landing areas for skiplanes include frozen lakes and rivers, so knowing your ice is important too. Glaze ice is essentially frozen snow packed down solid. Be on the lookout for frozen ridges and ripples caused by blowing snow in these areas. Aiming your approach parallel to ridge rows that are visible or in a lee area can help make for a smoother landing. Glare and clear ice, while pretty to look at, can be extremely slick and provide little or no directional control when on the ground. Add a stiff crosswind and you might wind up as a new contestant on Airplane Ice Dancers.

Another hazard encountered by skiplane pilots is a phenomenon known as "flat lighting." This is where overcast skies and snowy hills visually converge and can wreak havoc on a pilot's depth perception at low altitudes. Flight operations should be discontinued if these conditions exist. In fact, you'll find flat light conditions surface in several NTSB accident reports, including one from 2012 where the pilot of Cessna 180 inadvertently struck the ground with his left ski during a landing site pass on a glacier. The gear collapsed and the left wing hit the snow-covered ice causing substantial damage.

To enhance depth perception on landing, try using a shoreline or tall grass as a reference point. A good pair of sunglasses will help, too.

Sign Me Up for Ski Lessons

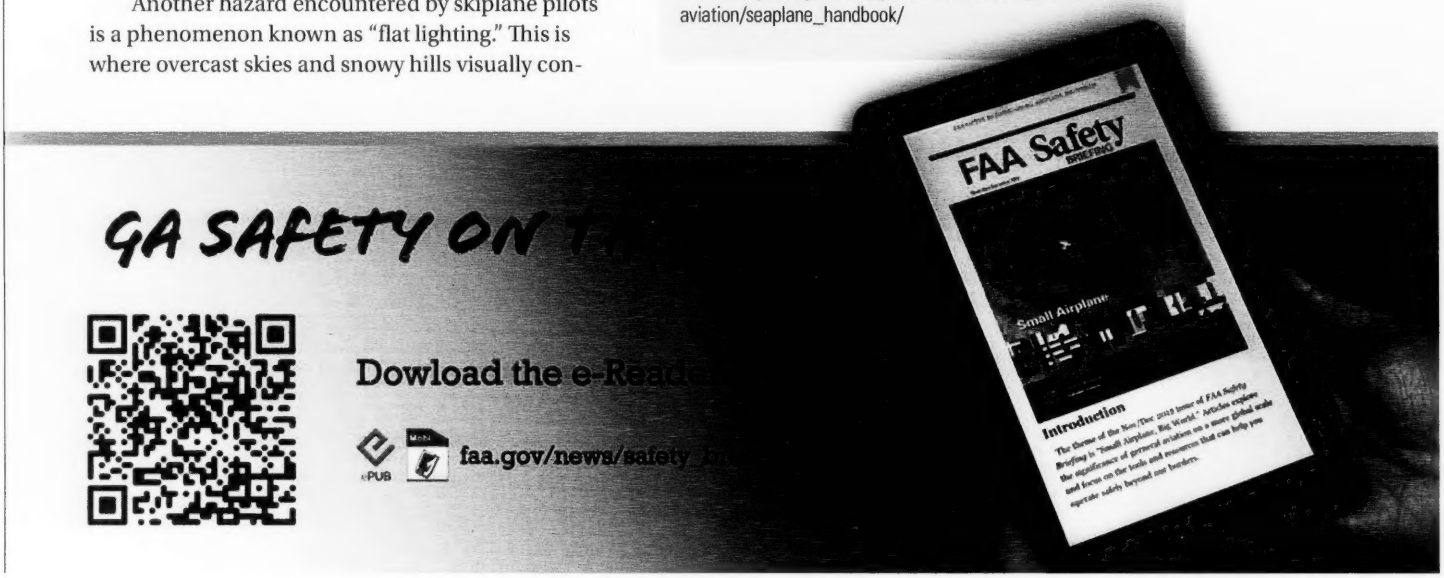
Do you now have visions of a remote ice-fishing or snow-shoeing expeditions floating around in your head? If so, and you live in or near a ZIP code that's no stranger to the white stuff, why not seek out a flight school that specializes in skiplane training? "While there are no specific training requirements, I recommend a minimum of two to three hours with a qualified instructor to learn the ins and outs of flying with skis," says Yorke.

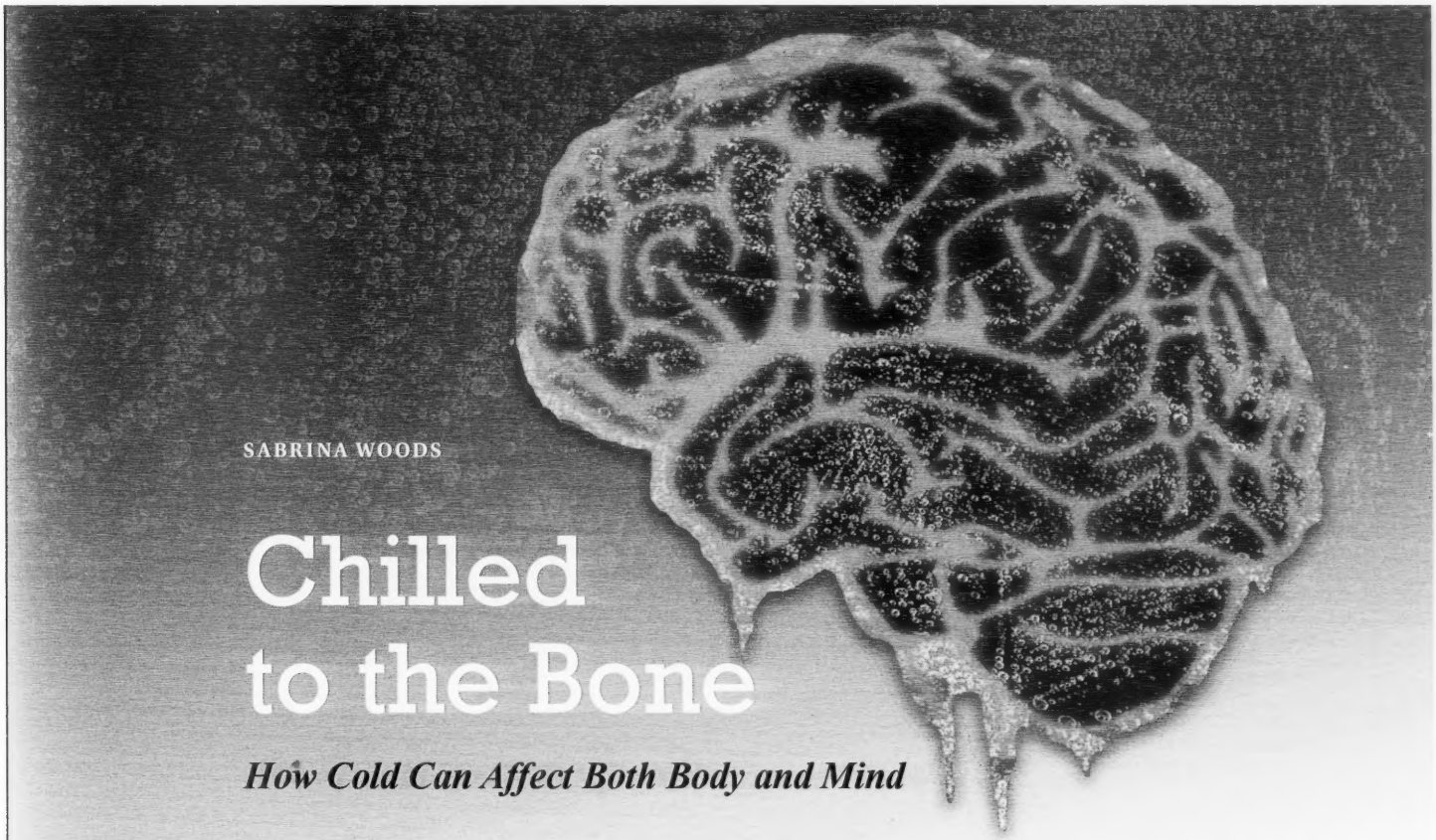
In addition to expanding your knowledge of winter weather operations, flying with skis can open up a new world of flying opportunities with an almost endless amount exploration options. Consider it a lift ticket to the skies.

Tom Hoffmann is the managing editor of FAA Safety Briefing. *He is a commercial pilot and holds an A&P certificate.*

Learn More

FAA Seaplane, Skiplane, and Float/Ski Equipped Helicopter Operations Handbook
www.faa.gov/regulations_policies/handbooks_manuals/aviation/seaplane_handbook/





SABRINA WOODS

Chilled to the Bone

How Cold Can Affect Both Body and Mind

Winter will soon be in full force and if you are anything like this Arizona native, the very idea of it is daunting. Sure, winter brings some of my favorite things: skiing, hockey, and everything having to do with warm, spiced drinks. But it also brings extra layers of clothing, runny noses, slick sidewalks, and static electricity *everywhere*.

Far more insidious, prolonged exposure to the cold of the winter months can wreak havoc on your body, slowly corrupting your basic motor functions. The deception here is that it is not always the actual cold that will get you, but rather the effects of the cold that can have serious adverse consequences. These effects are called cold stress and for airmen, the cumulative effects can be a chilling wake-up call.

Let me explain further.

Cold Case Files

The following scenarios will be in Fahrenheit (apologies to my more metric-savvy readers) and I will factor in the "wind chill" — the relative temperature your exposed skin and body feel when air temperature and wind speed are combined.

Scenario 1
50 degrees: I'd be in jeans, a long-sleeve shirt, and closed-toed shoes. I'd have my favorite zip-up hoodie to ward off the chill. My Canadian buddy, René, clad only in shorts and a tee, *might* consider switching from flip-flops to boat shoes.

Scenario 2
45 degrees with 10mph winds (effectively lowering the temperature to 40 degrees): I am starting to shiver despite my clothing. My teeth are chattering and my fingers and ears, which are exposed, start to tingle. René puts on socks.

Scenario 3
40 degrees with 15mph winds (32 degrees): If I don't get a heavier coat and gloves to help keep me warm, my fingers and hands will go numb. Any exposed skin would start to pale and my muscles would spasm. René sips some coffee.

Scenario 4
32 degrees with 15mph winds (22 degrees): Despite putting on a heavy winter coat, gloves, a scarf, and insulated boots, my strength is being sapped. My breath has become labored and I find it harder to pay attention to the task at hand. René puts on a tuque.

Scenario 5
20 degrees with 20mph winds (4 degrees): Due to my prolonged time out in the elements my muscles have become stiff. My speech is slurred and my breathing has become shallower and slower. I feel confused and sleepy and although the shivering has stopped, my body is cold to the touch. René adds a scarf.

All humor aside (and with much love to my neighbors to the north), the intent here is to show that with only a five to eight degree difference

Wind Chill Chart

Wind (mph) \ Temperature (°F)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5		36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10		34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15		32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20		30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25		29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30		28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35		28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40		27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45		26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50		26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55		25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60		25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times ☐ 30 minutes ☐ 10 minutes ☐ 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph) *Effective 11/01/01*

between most of the ambient temperatures, the wind had a big impact on the relative temperature. Humidity also plays a role. In fact, when it comes to potential for cold stress, a damp, windy 50-degree Seattle day is effectively no different from a calm, dry 35-degree day in Denver. And although there is some merit to the idea that people from different climates are more tolerant of their own indigenous weather patterns — i.e., Arizonans defending their "dry heat" and Winnipeggers relishing any day that clears zero degrees F — the fact is that the average human core temperature is 98.6 degrees. This temperature *must* be maintained in order for the body to function properly. Any atmospheric temperature between 32 and 60 degrees can lead to non-freezing cold weather injuries such as chilblains — the painful inflammation of small blood vessels in your skin, or worse, hypothermia — a medical emergency that occurs when your body loses heat faster than it can produce it, causing a dangerously low body temperature.

It's a War in There

Leading the charge in cold weather combat is your brain's hypothalamus. This gland's primary job is to maintain balance within your body and as such, it also serves as your internal thermostat. Through the process known as thermoregulation, it will beg, borrow, and steal what it needs just to keep the vitals — in particular your heart, lungs, and brain — up to temperature. It is the body's ultimate defense system against the dipping degrees, and your extremities are the poor pawns that will be sacrificed first on the frontlines of battle.

This is why those fine motor skills are the first things to go when you get cold. Your hypothalamus and autonomic nervous system trigger many different reactions to jump start the heat. You might shiver or your teeth might chatter — expending this kind of energy generates a small amount of warmth. Then come the "pins and needles" in your fingers and toes, and your ears and nose might get a burning sensation. This is a result of the capillaries underneath the fine, thin skin constricting as blood flow is reduced (reserving it for the vitals).

Be prepared by recognizing a bad situation before it starts, understanding how your body will react to that situation, and having what you need to help your hypothalamus out.

And these are just a few examples of the *early* stages of hypothermia. The later stages get much worse. A significant drop in body heat left unchecked leads to permanent nerve damage, muscle lock, weakness, a substantial decrease in cognitive ability, and a slowed pulse. It will eventually lead to unconsciousness and finally, death.

What does all this mean for those who take to the air or maintain aircraft in these lower temps? Two words: be prepared. Be prepared by recognizing a bad situation before it starts, understanding how your body will react to that situation, and having what you need to help your hypothalamus out.

Baby, It's Cold Outside

The first part of being prepared is recognizing your situation. This means being able to predict the weather to within a few degrees of actual. You need to know the forecasted precipitation levels, winds, and how much ice and snow would preclude you from flying altogether. Crosswinds, windshear, and gusting winds have felled more than one seasoned aviator, so take measures to avoid becoming a statistic. Shorter winter days invariably increase the times at which you might end up flying in the dark, a situation that makes for a whole different set of challenges besides just the weather.

Your forecast should include your destination, as well as some "Plan B" contingency routes. Besides requesting a weather briefing from Flight Service, either by phone or via DUAT/DUATS, there are many different weather information tools you can use to plan your flight. You probably know about the ADDS site (www.aviationweather.gov/adds/) operated by the National Weather Service. For both preflight planning and inflight updates, some favorites among the smartphone and tablet users are: NOAA Radar US, MyRadarPro, Intellicast HD, and ForeFlight. Like some of the newer panel-mounted avionics devices, some of these also include ADS-B weather.

To get the greatest benefit from these tools during winter, you'll want to know at least three things. First, where is the freezing level? Second, where (and at what level(s)) is precipitation present or likely to form? Third, where are these weather phenomena in relation to your route of flight? The weather may be different above the ground than what is occurring at the surface. Hazardous conditions such as icing, turbulence and reduced visibility must be considered for any flight during the winter months. This information is key to helping you develop contingency plans.

You're as Cold as Ice

In addition to focusing on the fast moving fronts, strong winds, blowing snow, and icing conditions that can come with winter flying, you have to be aware of how each change in the climate affects your body. Don't dismiss it when, while standing in a snowbank trying to clear the ice from your prop, your fingers and toes start to protest. Remember they are *pawns*, and there are far greedier organs at work here. Respect the fact that if you are uncontrollably shivering, the path to hypothermia has already started. The next steps on that path are poor judgment and apathy, which could negatively influence your go/no-go decision making abilities. Note too that difficulty balancing or walking could turn a misjudged step into a real catastrophe — especially when there is ice involved.

Any part of your body directly exposed to the elements will be subject to frostbite, which is when the skin and underlying tissue begins to freeze. It most commonly occurs in the fingers, toes, cheeks, ears, and nose. First degree frostbite — indicated by that tingling or burning sensation — can be irritating, but it rarely causes any permanent damage once the tissue thaws. Third degree frostbite, on the other hand, is signified by the complete loss of sensation, and swollen and purplish skin color. It often results in permanent damage.

Everyone, regardless of body mass, age, race, gender, and overall health, is susceptible to hypothermia and frostbite. The discriminating factors only serve to vary the amount of time one progresses through the cold stress stages.

Prep Yourself, Before You Wreck Yourself

Before you even tend to that flightplan and preflight, you need to prep yourself. Some things to keep in mind are:

- A full tummy is a happy hypothalamus. Sounds odd, but trust me — in our incredibly intricate (and often awe-inspiring) biology, everything is connected. Eating keeps your metabolism up which, in turn, also keeps you warmer. Stay hydrated, also.
- Even though it's already prohibited by regulations, it might help to know that consuming alcohol to stay warm is merely a myth. Contrary to the wonderful misconception of an Alpine St. Bernard carrying a barrel of brandy to stricken mountaineers, drinking alcohol lowers the core temperature of your body. It also impairs your judgment and undermines the body's ability to do things (such as shiver) to keep itself warm.
- Limit direct exposure to the elements. If you can prep and preflight in a hangar, or behind a wind break, do so. Adhere to work/rest cycles if you must continue working. The less time you spend in the cold temps, the less likely it is for cold stress effects to take hold. In addition, stay as dry as possible. When clothes get wet they are no longer able to retain their insulation.
- Don't overdo it! One of the key factors of cold stress is early fatigue, so overexerting yourself will only exacerbate the situation. The more energy you burn through, the less your body has to maintain its core temperature. Make sure you get plenty of rest before heading out.
- Always dress for the weather you are flying in. Even when departing in more temperate weather, if your destination leads you on a path over mountainous terrain, higher altitudes, or lower temperatures, dress for it! Dress using many thin layers so you can adjust as needed. Wear a hat to prevent losing heat from your head. Insulated boots and gloves are a must, and for all of your clothing, choose synthetics or wool rather than cotton, as cotton loses all functionality when it gets wet. Lastly, wear a good water-proof coat as an outer layer.

Understand that when the drifts and gusts get high, it is a possibility that the destination FBO, although near and dear to your heart, might be pretty far down on the list of priority for those whose job it is to clear and maintain the roadways. This can mean two things for you. The first is that if the weather turns nasty forcing you to jump to Plan: "Get Down as Quickly and Safely as Possible." That same nasty weather could create a serious problem for your survival at whatever parking patch you end up claiming. Even if you get to your intended destination, there is no guarantee that it will still be open and waiting to accept you. Inclement weather can shut down a landing strip fast, leaving you, quite literally, out in the cold with rescue capability severely hampered.

Not only should you dress warmly enough to withstand the cold, you might want to also consider packing a few essentials in your aircraft to bridge the gap to rescue. This list includes some high-energy food, water, a Mylar blanket, a change of clothes in case yours get wet, some chemical warming packets, and an emergency locator transmitter and cell phone.

Everyone, regardless of body mass, age, race, gender, and overall health, is susceptible to hypothermia and frostbite.

You don't always have to flee or fold-up when the cold months come. With an understanding of cold weather patterns and effects, and some careful preparation on behalf of you and your aircraft, you can keep flying all through the hazy shades of winter.

Sabrina Woods is an assistant editor for FAA Safety Briefing. *She spent 12 years as an aircraft maintenance officer and an aviation mishap investigator in the Air Force.*

Learn More

NWS Wind Chill Calculator
http://www.nws.noaa.gov/om/windchill

OSHA Winter Tips
https://www.osha.gov/dts/weather/winter_weather/hazards_precautions.html

FAA Winter Flying Tips
http://www.faasafety.gov/gslac/alc/libview_normal.aspx?id=10520

PAUL CIANCIOLO

Keeping Your Cool in the Cold

Making the Most of Winter Flying Opportunities

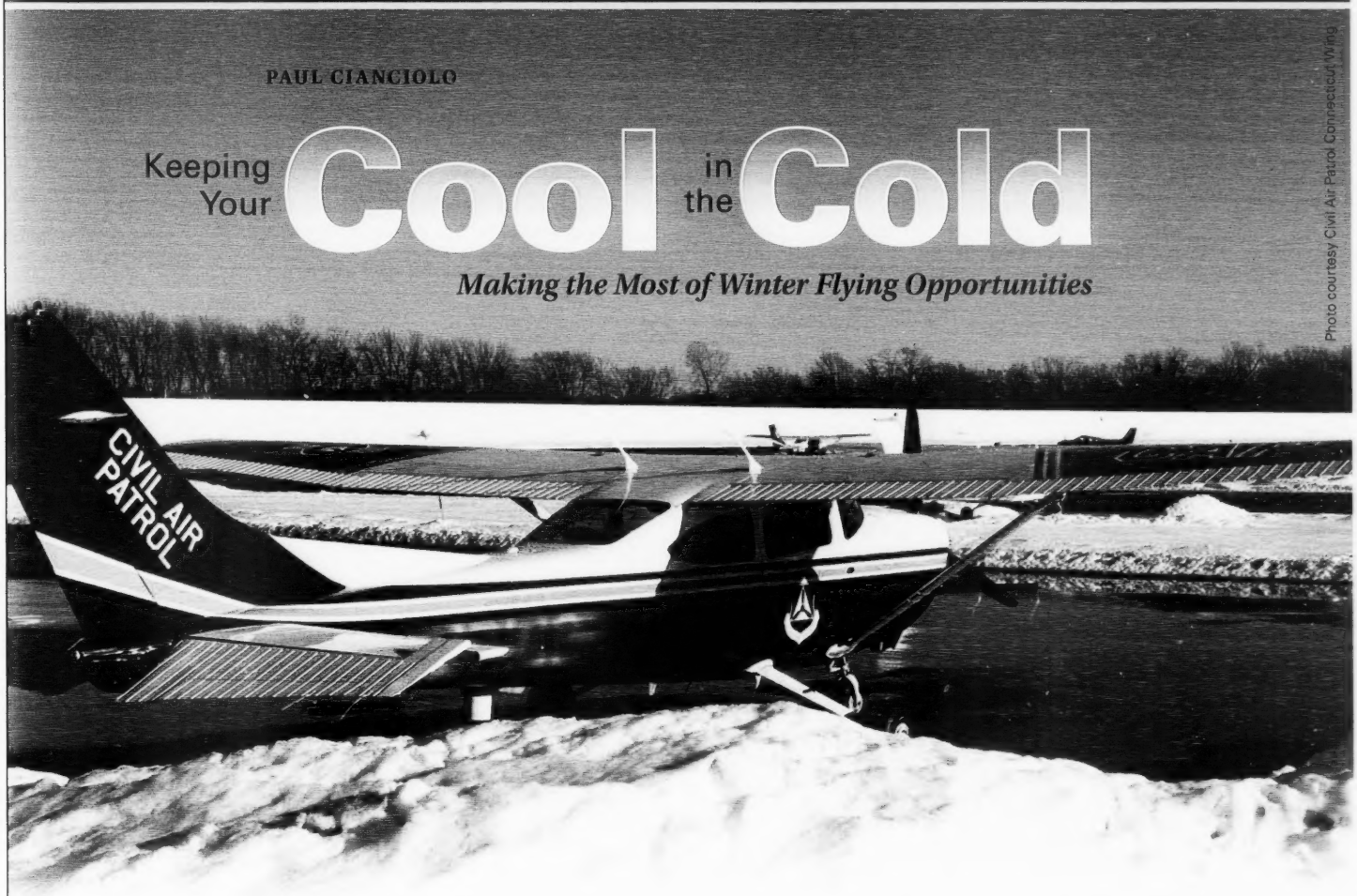


Photo courtesy Civil Air Patrol Connecticut Wing

If you've decided to fly this winter — and not flee or fold up shop — then it's time to dig your airplane out of the snow and give it a good checkup. Here are some tips to help you and your airplane bear the cold and have a safe winter flying season.

Silent but Deadly

Since you'll likely be using more of your cabin heater this time of year (the predominant source of carbon monoxide (CO) contamination), be sure to thoroughly inspect your CO detector. If you use a chemical spot CO detector, check its expiration date. Once unwrapped, these simple life-saving devices typically only last three to 18 months depending on the brand. Even if still in the original packaging, it will expire after a few years.

Frost, ice, or snow the thickness of sandpaper will reduce lift by 30 percent and drag by 40 percent.

"Heaters require special attention," explains Peter Wilhelmson, an airworthiness aviation safety inspector with the FAA Safety Team (FAASTeam). "Components such as combustion liners, air pressure switches, and fuel regulator valves have been known to be problematic and have resulted in FAA issuing airworthiness directives (ADs) as corrective measures. You should know if an AD applies to the combustion heater installed on the aircraft you are working on or flying."

Since you are checking that heater, have a look at the battery as well. Although winter normally reduces cranking power, a healthy aircraft battery should only need charging after several weeks of disuse. When in doubt, have it tested. And don't forget that Title 14 Code of Federal Regulations (14 CFR) part 43, Appendix A, allows pilots to do some preventive maintenance on batteries, including replacing and servicing.

In Liquid State

Another possible contributor to poor battery performance is your engine oil. Oil that's too thick will keep your engine from starting in cold weather because it challenges your battery and starter motor to spin the engine fast enough for it to fire. Engine preheaters might help, but you may also need to change to an oil better suited for cold weather operations. Check your aircraft manual for specifics.

The other important liquid to consider is your fuel. Some aircraft require special fuel additives,

FAA photo

Left –When is the last time you or a technician inspected the heater components in your aircraft? The burned up combustion heater pictured here caused a Cessna 401 to crash in 2012. A CO leak, fuel leak, or fire can be catastrophic, so please give it special attention during your next inspection.

Below –Before any flight, clean off all frost, snow, and ice from the aircraft.

Photos: top and center by H. Dean Chamberlain, bottom by James Williams

which change the low temperature characteristics of the fuel. Check with the manufacturer to see what's recommended. There is also a greater risk of water condensation in the aircraft fuel tanks during winter, so drain fluid from all water drains — yes, *all* of the drains. It may be cold outside, but this is not the time to skip this vital check.

Keep it Clean

Before any flight, clean off all frost, snow, and ice from the aircraft. Use a soft broom or snowbrush to remove snow — or better yet, use clean towels/rags to prevent scratching the paint by accident. The best way to melt frost or ice is inside a warm hangar for an hour. However, if that is not an option, spray the aircraft with an approved deicing fluid. Do not use automobile anti-freeze to deice your aircraft — it has a different chemical consistency and application requirement. Remember that frost, ice, or snow the thickness of sandpaper can reduce lift by 30 percent and drag by 40 percent.

As stated in one of its safety alerts, the NTSB "believes strongly that the only way to ensure that the wing is free from critical contamination is to touch it with your bare skin." Physically check if the wing is simply wet or if it has a thin film of ice on it. Have gloves handy to keep your hands warm after your inspection.

If you just returned from a flight and are about to depart again, check for newly formed frost or clear ice over the wings, even if the temperature on the ground is above freezing. The wings may still be below freezing due to "cold soaked" fuel tanks from flying where the air is much colder.

Once you start moving in your aircraft, you don't want to undo all the work you did to clean it off. Taxi slowly to avoid throwing up snow and slush into the wheel wells and onto aircraft surfaces. Taking it slow is also safer. You have more response time in case the tires decide to slide on an icy patch.

"Remove the airplane's wheelpants if equipped," notes Jay Flowers, FAASTeam program manager at the Fargo Flight Standards District Office. "Slush and ice can collect inside the wheel pant and freeze the brakes to the rotors making for an interesting landing with wheels that won't spin. Removal of the wheelpants will also allow you a clearer view to inspect tire condition and the possibility of leaking fluid."

Beware that the tail section of the aircraft builds up ice three to six times faster than the wings.

Once in the air, if you see ice forming anywhere on the aircraft, get out of the icing conditions as soon as possible. Depending on where warmer air may exist, this might mean climbing to a higher altitude. If you do notice ice, pay close attention to your airspeed. As little as a 1/4 inch of leading-edge ice can increase the stall speed 25-40 knots.

Finally, avoid flying at cloud tops. The concentration of water droplets is often greatest near the top of the cloud and ice could build up quickly.

Watch Your Rear

Did you know that the tail section of an aircraft typically builds up ice three to six times faster than the wings? This is due to the sharp-edged surfaces that are more susceptible to collecting ice. And since the tail is often out of sight on many aircraft, ice buildup there can easily go unnoticed. Be sure to refer to your aircraft flight manual (AFM) or pilot's operating handbook (POH) for more on the hazards of tail ice and any specific procedures your aircraft manufacturer recommends.

If you're using an autopilot, be aware that it could mask some of the symptoms of ice accumulation (both tail and wing). Be on the lookout for abnormal elevator effectiveness and vibrations, a sudden nose-down pitch, and/or the autopilot performing excessive pitch trim.

Playing it Safe

If you experience icing, notify ATC so that others may be warned. If you are in trouble, ask for help and squawk 7700 to make it easier for ATC to pinpoint your location and help get you out of the icing conditions and land safely.

Winter may offer the best air for flying, but it also presents its own set of challenges. The most important thing to remember is that there is no such thing as a little ice. If you have a great winter flying tip not included here, please Tweet it to us at @FAASafetyBrief.

Paul Cianciolo is an assistant editor and the social media lead for FAA Safety Briefing. *He is a U.S. Air Force veteran, and a rated aircrew member and search and rescue team leader with the Civil Air Patrol.*

Learn More

FAASTeam Pamphlet: Winter Flying Tips
http://1.usa.gov/ZeHw2O

FAASTeam Course ALC-33: Inflight Icing
http://1.usa.gov/1r0GRxB

FAA Got Weather? Campaign
www.faa.gov/go/gotweather

NTSB Safety Alert: Aircraft Ground Icing
http://1.usa.gov/ZeHE2e

AOPA Cold Facts: Wing Contamination
http://bit.ly/1rv4rgZ

JAMES WILLIAMS

FIKI *Wiki*

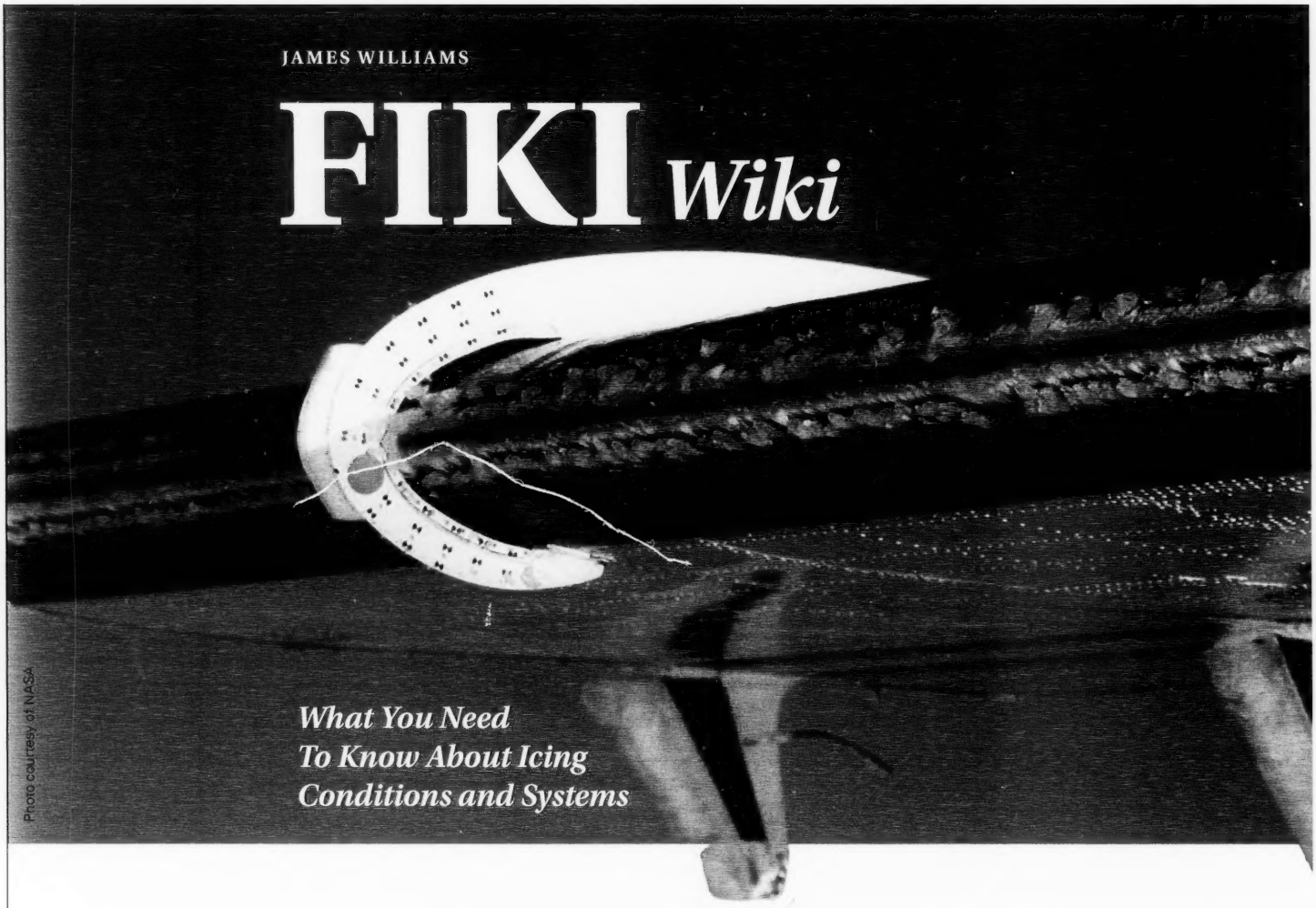


Photo courtesy of NASA

What You Need To Know About Icing Conditions and Systems

After studiously avoiding ice, you finally have access to an airplane whose specs include FIKI — approval for Flight Into Known Icing conditions. Before you launch into the winter skies with abandon, though, you first need to abandon the idea that FIKI offers a completely free pass. FIKI or no FIKI, as in any light part 23 aircraft, the safest and most complete strategy is to simply avoid icing conditions. Good as they can be, today's technology solutions still have limitations and ice can compromise or overwhelm even the best of them. That's why it's important to know what FIKI can and cannot do for you, which we'll cover in this article.

Anti-Ice vs. Deice

First things first. The terms "anti-ice" and "deice" are sometimes confused, especially since an aircraft might be equipped with both. Here's the difference. Anti-icing systems are designed to prevent ice from accumulating on protected surfaces or components. Deicing systems are designed to remove ice after it forms. Both systems have advantages and limitations in terms of performance, as well as in terms of installation and operation and some can even be used for both functions. Regardless of whether a system is used in an anti-ice or deice capacity, it's useful to remember that there are basically three ways to deal with ice: *heat it*, *treat it*, or *change it*.

Heat It

The ice treatment solution you are most likely to see on airliners is leading edge heat. In turbine powered aircraft, this function is accomplished by directing bleed air from the engines to the leading edge of the wings, thus making them too warm for ice to form. While the "plumbing" of the ducts from the engines to all the protected surfaces might be complicated (which makes it a less practical installation on GA aircraft), the relatively "free" heating source makes up for it. The very effective bleed air approach allows most airliners to tolerate far worse conditions than most GA aircraft.

There are basically three ways to stop formation of or remove ice on any given surface: heat it, treat it, or change it.

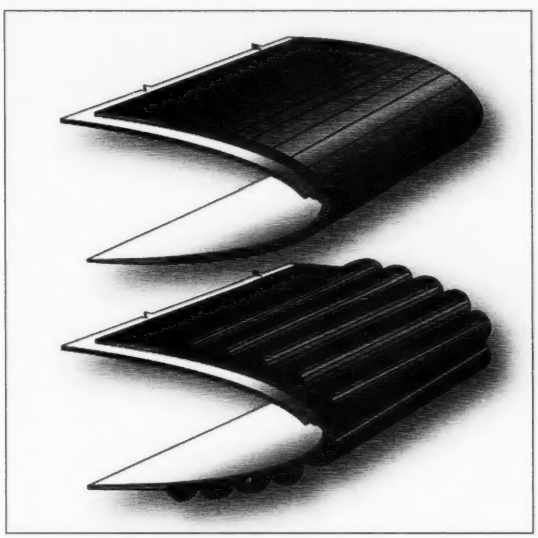
Some GA aircraft do benefit from surface heating provided by electric heating elements. Elements like these are already used in applications such as pitot heat. The problems with broader use arise from the significant draw that electric heating elements place on the aircraft's electrical system. In such cases —

and usually for FIKI use — certification sometimes requires a separate dedicated alternator to handle the ice-related electrical load.

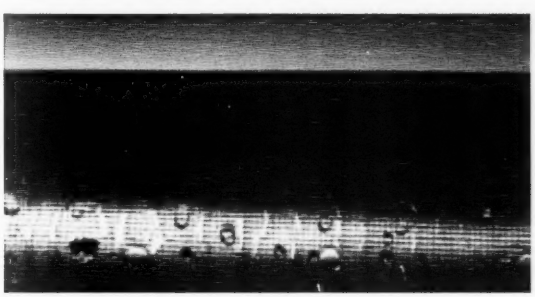
Change It

The second way of handling ice is to break it off — literally. Since you can't exactly crawl out on the wing with an ice scraper (much less ask your passengers to do it), the technological solution is to use pneumatic boots to change the shape of the wing's leading edge. Boots are a great way to remove ice from protected surface, but they are strictly a deicing solution since they don't prevent ice formation.

Regardless of the mental picture conjured by the term, a de-icing boot consists of a series of narrow strips that run along the leading edge of the wing, or any other protected surface, and extend far enough back that ice is unlikely to accumulate. Because they require lots of high pressure air to inflate them, boots are usually reserved for select turbine or turbocharged aircraft. As long as the high-pressure air is available, though, boots have an essentially unlimited operating endurance, as they don't put a massive load on the electrical system.



Cross-section of a pneumatic deicing boot uninflated (top) and inflated (bottom).



TKS weeping wing anti-ice/deicing system.

Before we move on, let me clear up a long-held misconception about "ice bridging." For many years, the common practice for operating with boots was to wait for a specified amount of ice to accumulate before cycling the boots. The idea was to prevent ice from forming around the boots in their expanded form, thus rendering them useless in breaking off additional ice. After much NASA research, though, new guidance states that the best strategy is to activate the boots as soon as icing conditions are encountered. According to the NTSB, "Leading-edge deice boots should be activated as soon as icing is encountered, unless, the aircraft flight manual or pilot's operating handbook specifically directs not to activate them."

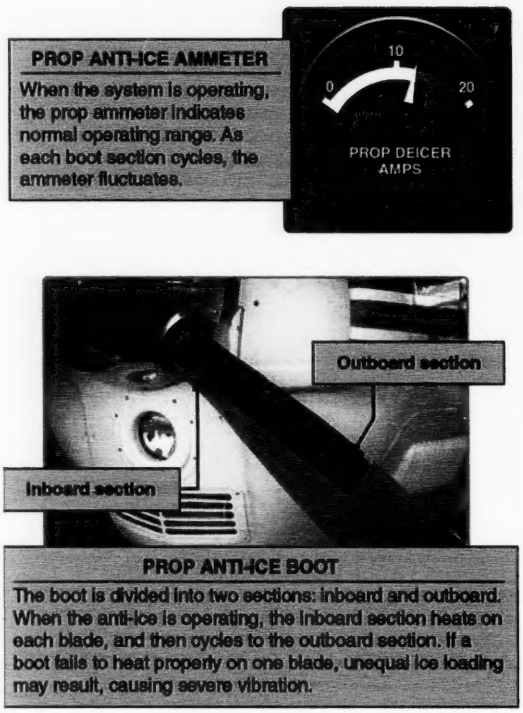
Treat It

For GA aircraft, one of the most accessible means of deicing (which, depending on the application, can also be an anti-icing solution) is through "weeping wing" technology. In this approach, special panels are installed at the leading edge of all protected services. These panels extrude, or "weep," a mixture of fluid that can provide both deicing and anti-icing protection. An advantage of this approach is that the rearward flow of the fluid over the wing surface protects a broader surface area.

The weeping wing approach does not create a large electrical draw or require heated air. However, weeping wing solutions have two drawbacks. One is the added weight of the tank, pumps, plumbing, panels — and of course, the fluid itself. A second is the very definite operating time limit. The system can only function so long as there is fluid, which means that icing protection is exhausted as soon as the tank is empty. The size of the tank varies depending on installation and customer desires, but the operating time is usually in the range of 90 minutes to three hours, depending on flow rate.

The Wing's Not the Only Thing

Bear in mind that in addition to the wings and stabilizers, other aircraft surfaces need to be protected. These usually include windshields, propellers, and possibly air intakes or sensor ports. This is usually where you get some technology mixing. A boot-equipped aircraft may have a heated windshield and alcohol-equipped props. Smaller items


PROP ANTI-ICE AMMETER
When the system is operating, the prop ammeter indicates normal operating range. As each boot section cycles, the ammeter fluctuates.
0
10
20
PROP DEICER AMPS
Outboard section
Inboard section
PROP ANTI-ICE BOOT
The boot is divided into two sections: inboard and outboard. When the anti-ice is operating, the inboard section heats on each blade, and then cycles to the outboard section. If a boot fails to heat properly on one blade, unequal ice loading may result, causing severe vibration.

Prop ammeter and anti-ice boots.

like sensor ports are usually covered by small heating elements similar to pitot heat. Another item is an ice detection system. Such systems are fairly elaborate in the airliner world, but sensors in GA aircraft can be as simple and as basic as a light that allows you to monitor the condition of a representative surface.

Houdini or FIKI

Even with — or maybe especially with — a FIKI capable aircraft, there is still a decision to make with respect to actually operating in icing conditions. With a non-FIKI airplane, it's a clear no-go. With a FIKI capable aircraft, though, the decision requires a thorough understanding of systems — both technological systems and weather systems.

With respect to the technology, you need to be very clear on whether the aircraft is approved for FIKI and if so, under what conditions and limitations. In many circumstances, even approved systems will not allow prolonged flight in icing conditions. The best source for this information is the Pilot's Operating Handbook (POH), which will include a supplement for the installed system(s). Unless the supplement clearly states that the aircraft is approved for flight into icing conditions, you do not have a FIKI capable aircraft. In many cases, though, the POH supplement for non-FIKI equipment will clearly state that Flight into Icing Conditions is Prohibited.

Remember, too, that STC installation of weeping wing or boots does not carry FIKI approval in and of itself. An STC means only that installation of the item will not have a negative impact on aircraft systems or operation, but it does not indicate whether any benefit claimed by the manufacturer has been tested. Many of these systems are designed only to allow the pilot to escape unforeseen ice, and not for intentional flight into such conditions. And, especially with a limited ice escape system, know what the technology can and cannot do. For example, a FIKI-capable TKS™ system is likely to provide greater coverage, a larger tank, and redundant pumps as compared to the non FIKI system. Many escape systems also don't provide windshield coverage. It's also important to know that there can be a FIKI and a non-FIKI option for a lot of systems. Buyer beware!

Though a discussion of winter weather and icing is beyond the scope of this article, any decision with respect to flying in known icing conditions requires the pilot to have a detailed understanding of weather conditions and forecasts along the route of flight. Not even the stoutest of GA aircraft FIKI systems can withstand the onslaught of perils like freezing rain or supercooled drizzle drops. As in any kind of weather flying, knowing the fastest or safest way out of ice (or other hazardous conditions) is a critical part of the flight planning process.

One last thought for this FIKI WIFI survey: you can never know enough about weather, and you can never know too much about the systems you have to help you through it. Knowledge is the key to making the most of your technology and, if you're fortunate enough to fly FIKI, to using it safely and well.

James Williams is FAA Safety Briefing's *associate editor and photo editor. He is also a pilot and ground instructor.*

Learn More

NTSB Safety Alert: Activate Leading Edge Deice Boots As Soon As Airplane Enters Icing Conditions
http://www.ntsb.gov/doclib/safetyalerts/SA_014.pdf

AC-91074A Pilot Guide: Flight In Icing Conditions
http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_91-74A.pdf

AMT Handbook Chapter 15: Ice and Rain Protection
https://www.faa.gov/regulations_policies/handbooks_manuals/aircraft/amt_airframe_handbook/media/ama_Ch15.pdf

Ice Protection Systems Compliance Requirements (14 CFR 23.1419)
http://go.usa.gov/dEET

PAUL CIANCIOLO

Planes Aren't Made for Ice Dancing

How to Plan for Slippery Surface Operations

Photo by James Williams

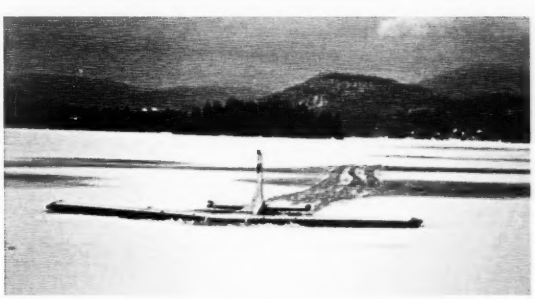
The snow finally stopped falling and the sun is actually shining! Finally. It's the perfect day to get out of the house and go flying. After clearing your airplane of all the remaining snow and ice, and shoveling a path to the plowed taxiway, you can finally hop in and get that engine started. Since you are thoroughly cold from all that preflight activity outside, you want to get moving and get the cabin warm. Off you go zipping down the taxiway and pass the north side of some hangars, which is in perpetual shade. *Thud.*

You are now in a horizontal triple Axel spinning down the taxiway. You think, "steer into the turn," but that doesn't do anything. The nose wheel doesn't turn like in a car — since you are on the ground, you have "driving" on your mind. You better shut down that engine in case you hit something.

Everything is White

You are now nose-first in a snow bank. As you squeeze out the door and onto the snow, you see two people in the window of the FBO holding up paper napkins with "10"s written on them. We all know the type — pilots love to judge other pilots. This is not what you had in mind for a fun day of flying. At least there were no controllers with a bird's eye view to judge you as well.

FAASTeam Photo



Snow bank related accidents are the greatest hazard to aircraft ground operations during the winter season.

What happened? Your wing clipped a tall pile of snow along the edge of the taxiway on the only stretch of pavement covered with a layer of ice and slush, which was hidden in the shade.

"Winter operations at non-towered airports can be a challenge, especially in the more northern regions of the United States. Airport managers and the like go south for the winter, leaving the airport to be maintained by the local city or county folks," explains Jay Flowers, FAASTeam program manager at the Fargo Flight Standards District Office. "Since most are not pilots and do not spend much time around airplanes, the concept of cleaning a runway may be one or two passes with the plow down a stretch of asphalt."

As part of your preflight, consider who cleaned the runway. Did they leave piles of snow at the runway and taxiway edges? Can you see the runway's lights and signage? Do you know your wing clearance from the ground? Is the runway plowed wide enough for your aircraft? Are all of the taxiways/runways plowed, or just at one end? It's up to you to collect as much information as you can before moving your airplane.

Push or Pull?

Since you are now stuck in the snow and possibly blocking access to the active runway, let someone know immediately. Notify ATC if they are at the airport. Otherwise, contact the airport manager. If

you cannot get a hold of anyone at the airport, call Flight Services at 877-487-6867 (Alaskan pilots will be referred to an appropriate in-state number to call) so they can issue an unsafe runway or unsafe taxiway notice to other pilots. Flight Services will also attempt to contact the airport manager.

Don't walk away and abandon your airplane either. Check your ELT, which might have been activated when you hit that snow pile. You don't want to be the subject of a search and rescue mission hours later when you are really at home keeping warm by the fire. It's happened before.

Next, call your local mechanic before trying to tow your aircraft out of the snow. Tying a rope around the tail section of your airplane and attaching the other end to the bumper of your pickup truck will only make things worse.

"Some aircraft can be very touchy as to where a 'tow something' can be attached to the aircraft," note Flowers. "You may have to contact the aircraft manufacturer to confirm your intentions."

Make a Hole

Good thing you shut down that engine before plowing into the snow bank. Except for your ego, everything else is okay. Your mechanic cleared your airplane. It's time to try again.

"Keep your taxi speeds slow and braking to a minimum," instructs Flowers. "Snow has the ability to restrict a pilot's view of the taxiway or runway surface. You may be on ice and not even know it."

To help steer clear of the safety risks associated with winter surface operations, it's best to just avoid operating at an airport unless the airport has explicitly reported that taxiways and runways are clear and prepared for taxi, takeoff, and landing.

Since you made it safely down the taxiway and don't want to show off your ice dancing skills again, make sure the run-up area is clear of snow and ice. Frozen brakes and a slippery surface could put your nose back into the snow. And you're still being judged from the warmth of the FBO peanut gallery. This time would not be a "10."

Photo by H. Dean Chamberlain

Make sure you have a clear path to the runway — even if you have to clear the snow yourself — and that your wingtips will clear all the snow piles.

Photo by James Williams

To help steer clear of the safety risks associated with winter surface operations, it's best to just avoid operating at an airport unless the airport has explicitly reported that taxiways and runways are clear and prepared for taxi, takeoff, and landing.

Fly Into the Wind

It really was a perfect day for flying — once off the ground. It's time to return home. Note that ramps and runways that were clear and dry during the day may become covered with water from melting snow and ice, only to refreeze after the sun sets. On wet or icy runways, opt for a landing direction most closely aligned with the wind even if you are an expert at crosswind landings. Otherwise the aircraft won't stick to the ground, and you will find yourself performing another ice escapade.

Since braking is not effective on a wet or icy runway, take advantage of aerodynamic braking by holding the nose up as long as possible. Aircraft control can only be maintained if the main wheels are rolling. Any braking should be applied gently and evenly using care not to lock up the wheels.

When the airplane slows down, control effectiveness from the rudder and ailerons are lost. The airplane does what comes naturally — it weathervanes into the wind. If there is ice, the amount of wind the airplane can tolerate drops dramatically. Just ask someone who flies a skiplane!

If it looks like a tailwind or crosswind landing on ice or snow is unavoidable, divert to an alternate airport and leave the dancing to the professionals. For more on this, be sure to read FAA Advisory Circular 91.79A, *Mitigating the Risks of a Runway Overrun Upon Landing*, which includes current and comprehensive guidance on the risks associated with tailwind landings and landings on wet or contaminated runways.

Brake for Moose

When landing during the winter months, also pay attention to critters on the runway and other clear zones. A warm, black runway soaking up the sun's rays attracts animals. "Nothing like a frozen blade of grass to warm a critters stomach," comments Flowers.

If landing at a towered airport, ask ATC for a braking action report to help you determine if landing is safe. ATC provides braking action advisories that are reported as Good, Fair (Medium), Poor, or Nil (Unreliable). Operations on runways reported as having Nil or Unreliable braking are inherently unsafe. You can help your fellow pilots too by submitting a pilot report on the runway conditions you encounter.

Remember that airplanes are more adept at "dancing" in the air rather than "dancing" on the ground. A slippery airport surface could be deadly to the "untrained" airplane. Remember to stay focused and think ahead to prevent any unwanted bloopers.

Paul Cianciolo is an assistant editor and the social media lead for FAA Safety Briefing. *He is a U.S. Air Force veteran, and a rated aircrew member and search and rescue team leader with the Civil Air Patrol.*

Learn More

FAA AC 91-79A: Mitigating the Risks of a Runway Overrun Upon Landing
http://1.usa.gov/Xw32P7

FAA SAFO: Operational Considerations for Airport Winter Operations
http://1.usa.gov/1rm6yaJ

AOPA Cold Facts: Braking Action Reports
http://bit.ly/1wmrFtS

FAA Runway Safety
http://1.usa.gov/1mvH6Nb

Checklist

SUSAN PARSON

Fire and Ice

During an unusually cold and miserable east coast winter a few years ago, I got this email from a flying club member: "Carb fire. Aircraft grounded."

Uh-oh. My plans for a cozy day by the fireplace went up in smoke as I scrambled to get information and take care of all the details that arise from even minor incidents. Though the damage was significant enough to require extensive and expensive repairs to the carburetor, there were no injuries, and the airplane was largely unscathed.

With winter weather fast approaching, we chose to focus this issue on helping you mitigate the hazards that winter poses for GA so you can better enjoy some of the benefits (e.g., better performance, clearer skies). My flying club's experience illustrates one of those hazards. If you fly an airplane with a carburetor, you should always be mindful of the potential for carburetor fires due to over-priming — especially in cold weather.

Prime Conditions for Fire

Even with preheat — essential in some circumstances, and highly desirable in many others — GA airplane engines can be very hard to start in cold weather. Pilots quickly learn that judicious use of the fuel primer can help, and here's why. In a carbureted aircraft, the primer delivers vaporized fuel directly to the cylinders. This "pre-vaporization" can help with cold-weather ignition because there is otherwise not enough heat already available to vaporize fuel in the carburetor and get the combustion process going in the engine, where it belongs.

The problem arises when too much time passes between priming and attempting to start the engine. Vaporized fuel doesn't last very long in that state. It quickly pools at the intake manifold, and the excess fuel drips into the cowl, around the air intake, and onto the ground below. Now all it takes is a single spark to ignite the various puddles of fuel and start a fire that could cause major damage or injury.

An Ounce of Prevention

There are easy and obvious ways to reduce the risk of carburetor fires. First is to avoid the need (and the temptation) for extra priming by keeping the engine warm to begin with. Keeping the bird in a hangar is helpful. A friend takes it a step farther: his AMT installed a small oil heater that he can plug into a hangar wall outlet. He uses an "internet of things" style app to activate the gadget only when he plans to fly. Remotely commanding the heater to start before he leaves for the airport gets the airplane's engine and vital fluids toasty enough for an easy start on cold mornings. (Yes, I am envious.)

If you are stuck with an outdoor tiedown space, it's worth renting overnight hangar parking from the FBO, if such options are available. My club's airplane has a rule requiring the pilot to arrange overnight hangar parking if temperatures fall below certain values.

The third option — using preheat devices — is better than attempting a stone-cold start, but it's the least desirable because it is awkward and often inefficient. It's also tough on the pilot and passengers, who get colder by the minute even as the engine is theoretically getting warmer.

Regardless of engine temperatures, the most important way to prevent carb fires is to avoid over-priming. Start with the smallest number of primer strokes, and increase up to the limit if the engine does not start. What's the limit? Theories differ, but many pilots (and schools) limit themselves to four strokes of the primer. Even if the POH allows for up to six strokes — and some do — consider that conditions requiring such measures are telling you something (e.g., you need to preheat!). If the engine starts and then falters, use the same number of strokes of prime, and crank the engine as you push in the last priming stroke. Engine roughness and black smoke are clear signs of over-priming.

What If ...?

Even if you don't think you are over-priming, you and your passengers should *always* be prepared for the possibility of a fire. Know the POH procedures by heart, and be prepared to execute them immediately if you see or suspect an engine fire. You and your passengers should also know the location and procedures for using the on-board fire extinguisher. I hope it goes without saying that you should not fly the airplane after any actual or suspected fire until your AMT inspects it for damage.

Keep the fire where it belongs, and enjoy the benefits of winter flying!

Susan Parson (susan.parson@faa.gov, or @avi8rix for Twitter fans) is editor of FAA Safety Briefing. *She is an active general aviation pilot and flight instructor.*

SABRINA WOODS

Deck the Halls with ... Avionics!

Stocking Stuffers for Your Airplane

Winter brings the gift-giving season. By now you might be starting to think about what to get for the people you care about — people like your significant other, children, other family, friends, and, of course, your favorite FAA representative. But once the humans have been sorted out and presents have been procured, you can turn your attention to what we all know is the real love in your life; your airplane.

What? You mean you haven't thought of your baby, sitting out there on a parking space patiently waiting for you to come back so you two can return to the skies? Well, no problem there. To help you out, I have compiled a quick list of some great gift ideas for your aircraft, and a few for yourself thrown in for good measure.

For the Aircraft

1. What aircraft wouldn't just beam with a new paint job? Much like the peacock strutting and showing off his glorious feathers, new paint can make an aircraft look and feel like a million bucks. Not only does it provide a certain measure of corrosion control, an updated aesthetic can increase overall value — always a good thing.

2. Like the exterior, a great new interior is a wonderful gift for your aircraft. Some planes might fancy pebble grain Italian leather in camel, while aircraft with larger families might prefer the super durable (and thankfully water-resistant) vinyl in a slightly darker color. Have a chat with your aircraft — see what she thinks — and then head out to find some swatches!

3. After January 1, 2020, ADS-B will become the FAA's primary means of aircraft surveillance with radar-based surveillance retained as a backup. Some benefits include more accurate GPS positioning, the ability to broadcast and receive ADS-B data, and the availability of traffic and weather advisory services for increased situational awareness. ADS-B Out will be mandated in 2020 for transponder-required airspace so why wait for the crush? Equip your baby now and start enjoying the benefits.

4. This goes without saying, but keeping your aircraft clean keeps corrosion, excessive wear, and those "hidden" cracks and leaks at bay. A dirty bird also adds extra weight and makes for a less aerodynamic experience so treat yours to a "spa" day with professional cleaners, or by gifting an aircraft cleaning kit.

5. Once the fun is over and you're putting your pride and joy away for the day, what could be better than encasing her with her very own custom "I-am-the-greatest" embroidered aircraft covers? Enough said!

For the Human (But Still Really for the Aircraft)

6. In this day and age everyone is focused on the latest and greatest aviation apps on the market. Your aircraft appreciates this, but so that you don't stray too far from the "aviate" tenet of aircraft operations, an item such as a tablet kneeboard or mounting kit would be great to keep those devices secure and within reach.

7. I love the sound of engine noise in the morning. Really, I do. But I must admit that hands down, the best money I have *ever* spent when it comes to traveling is on my noise-canceling headset. And that's as a passenger! Active noise reduction is pretty effective at reducing low frequency noise, such as the engine and propeller noise in a light aircraft, while still retaining the ability to communicate. A great gift for any pilot.

8. Whether on the slopes, on the trail, in the water, or trekking around Machu Picchu, little mounted cameras are all the rage. Just think of all of the breathtaking views and vistas you and your aircraft can capture with one of these mounted (safely) to her.

9. Another really nifty gadget is either a watch or handheld aviation GPS unit. This great back-up to aircraft instruments can relay crucial information regarding location, surroundings, weather, and some even have electronic flight bag capability. The best part is you can take it with you!

10. Last, but not least, is the often belittled, but always appreciated, gift certificate. So many popular aviation stores sell gift certificates that even the most finicky pilot and aircraft can simply go select what they want. A win-win for everyone.

I hope this helps the gift planning process a bit. Let us know what you think, and happy holidays!

TOM HOFFMANN

Reporting Live ... at Three Thousand Feet

How You Too Can Play an Active Role in Weather Safety

As we creep closer to the holiday travel crush, ask yourself this question: How comfortable would you be driving a fair distance without referring to some sort of in-the-field resource — like News Chopper 9's live report of a jack-knifed truck that is cutting off all four lanes on the interstate "you *thought* you were going to get to drive today?" Or without opening up the latest real-time and social-media supported traffic app you downloaded to your smartphone, complete with pothole reports and speed camera sightings? Imagine (or remember) how planning your drive would be without all those nice bits of eye-in-the-sky information. Pretty daunting, huh? Living right off the aforementioned interstate, I know I'd have my reservations about going to grandma's house, despite the decadent assortment of pies waiting for me.

In the aviation community, we have an abundance of weather tools available to help us with go/no-go decisions, many of which are laid out nicely with full-color touch screen displays. However, there is one weather tool that even the most advanced radar can't match — your fellow pilot. Pilot Weather Reports, or PIREPs, provide valuable information regarding weather conditions *as they exist* in the air. They can help pilots confirm the height of bases and the tops of clouds, locations of wind shear and turbulence and, especially important this time of year, the location of inflight icing.

When pilots encounter unexpected weather en route, they are encouraged to file a PIREP over the radio to a Flight Service Station or with air traffic control. The information will then be added to the distribution system to brief other pilots, help generate inflight advisories like AIRMETs and SIGMETs, as well as updates to the Current and Forecast Icing Products (CIP/FIP), and improve overall forecast accuracy.

PIREPs are fairly easy to file, but a new electronic way of submitting them has made the process even easier. In late August, the FAA announced the release of an electronic PIREP submission tool located on the National Weather Service's Aviation Digital Data Service (ADDS) website. The tool allows pilots to enter their turbulence and icing PIREPs electronically, for graphical display and nationwide distribution.

If you're interested in using this service, send an email to ncep.awcweb@noaa.gov with your location, phone number, and the name and email of the primary point of contact. The FAA will issue you an account once the information is verified. You'll then be able to go to www.aviationweather.gov/exp/pirep_submit/ to log in and start sending your PIREPS!

Electronic PIREP submission was also a recently announced feature with Lockheed Martin Flight Service's Data Link strategy. The system made its debut at EAA's AirVenture last July using a Honeywell in-panel flight tracking system. LMFS expects additional vendors will integrate the PIREP infrastructure in the near future. Go to www.1800wxbrief.com for more information.

PIREPs are easy to file, but a new electronic way of submitting them has made the process even easier.

Tom Hoffmann is the managing editor of FAA Safety Briefing. *He is a commercial pilot and holds an A&P certificate.*

Learn More

FAA Information for Operators (InFO 14011)
http://go.usa.gov/yqnG

FAA's Got Weather Campaign (December topic)
www.faa.gov/about/initiatives/got_weather/

Vertically Speaking

STEVE SPARKS

Hot Blooded, but Cold Feet

As fall fades away and winter weather arrives, safety experts from the United States Helicopter Safety Team (www.USHST.org) aim to put a freeze on helicopter accidents. The USHST is focused on a vision of zero accidents, and so far this year, total accidents have decreased significantly creating much needed traction heading into the winter season. As a result, the USHST wants to ensure that the helicopter industry doesn't slip in the wrong direction and reverse these positive trends.

To "break the ice," the USHST offers several tips to mitigate certain risks associated with winter flying. Everyone plays an important role as we crank up the thermostat on safety.

Dress for Success

Personal comfort is a major factor when it comes to safety. Just think back to the last time you rushed through a winter activity seeking shelter as quickly as possible to warm your hands and feet. Urgency can be a powerful force influencing human behavior and a false sense of urgency is even worse; it can tempt even the most professional of flight crews into taking shortcuts. It's amazing what humans will assume from a safety perspective when their bodies are uncomfortably cold. Those assumptions can be dangerous, however, so make sure "urgency" doesn't turn into an "emergency" for you this winter flying season.

Outdoor performance wear is an easy way to improve personal comfort levels to be able to handle the cold. Even summertime batting gloves can offer great thermal protection while providing finger flexibility for completing hands-on tasks around helicopters. Such specialty items also make great gifts for helicopter professionals. Remember, cold soaked parts on the helicopter will cause shivering discomfort to uncovered hands and fingers. Insulating the body from harsh temperatures can help maintain focus and fend off distractions caused by Old Man Winter.

Preflight and Ice

Helicopters left in freezing temperatures can cause major transformations in your equipment which can lead to unintended consequences. Never assume anything when you mix freezing temperatures with metal, rubber tubing, fluids, and/or control surfaces. As always, make sure ice, snow, and frost are completely removed from your helicopter prior to engine start. The only ice you want involved in your flying career is the amount you shovel into your soft drink at lunch.

Crews should approach preflight activities with the upmost respect. Airworthiness issues caused by cold weather can literally wreck your day. Ice is one wintery element that should be on every pilot's mind.

In January 2013, the FAA issued a Special Airworthiness Information Bulletin SW-08-03R3 (http://go.usa.gov/dkZH) addressing safety issues regarding airframe ice/snow on turbine-powered helicopters. The bulletin alerts crews to completely remove snow and ice from suspected and unsuspected areas on the helicopter. This action will help prevent possible power loss caused by ingesting such wintery elements into the engine.

For additional information regarding airframe icing, please read Matt Rigsby's article "Baby, It's Cold Outside" (http://bit.ly/1vr9SnW).

White-Out leads to Wipe-Out

Pilot induced white-outs are dangerous situations. These conditions can develop any time helicopters are taking off or landing in snow-covered areas. The rotor downwash picks up snow particles and re-circulates them through the rotor systems like a large mixing bowl. This can happen even on bright, sunny, and clear days. This zero visibility situation creates a feeling like you are flying inside a giant snow globe.

To help prevent helicopter self-induced white-outs, pilots should minimize time spent hovering over unpacked snowy areas. If landing on unprepared landing zones, be ready to abort anytime conditions become suspect. No one is forcing you to land in milk jug-like conditions. If this occurs, abort the mission and land somewhere else. It's ok to get cold feet in these dangerous situations close to the ground.

Adequate preparation for fending off the cold is crucial, while shortcutting safety for gains in personal comfort will certainly chill your day. Remember, the most important safety device in a helicopter is YOU. Like Santa, check your list twice this winter season. Please don't get cold feet on this one.

Dr. Steve Sparks is an Aviation Safety Inspector with the General Aviation and Commercial Division (AFS-820) specializing in Human Factors and helicopter operations. He is a certified flight instructor and serves as Coordinator for the US Helicopter Safety Team (USHST).

Flight Forum

Professional Cockpit Companion

For most of my life, I have been a clone of Susan Williams (July/August edition "Faces" highlight) in that I am a professional cockpit companion. I read aloud the checklist, I scan the skies for traffic, I correct my pilot husband if he reads back his flight plan incorrectly, I put in transponder codes and radio frequencies, I passed my written private pilot's exam, and I still monitor flight progress on my fold out maps, no matter that our Mooney 2000 Ovation has every navigational aid known to man.

During our many years of flying together, I have coped with a prop strike, a blown-out front tire on landing, a stuck landing gear that had to be hand cranked, and a landing gear collapse next to the fuel tanks as we were refueling. But I still really appreciated Susan Parson's articles in your last issue because they were a good refresher for me (i.e., I had forgotten that the transponder code should be set to 7700 in case of emergency). So thanks for directing so much of your attention to us professional flight companions. We know we serve as valuable aids to our pilot-husbands, even when as just last week, the mike was on when I corrected my husband's tower transmission and the ATC laughingly said to him, "Mooney, 22184, I see your wife is with you again!" How right he was!

— Kathy

It was great to hear from you, Kathy, and we are especially delighted to hear that our July/August 2014 edition, "The Flying Companion's Guide to GA," has resonated with you and with so many of our "cockpit companions" out there! With the onset of the summer season we just felt that it was the perfect time to give some focus to those that fly with us, and we are really pleased with how the edition turned out. Thank you for your kind words and for reading.

An Interpretation, Please

What is the FAA's interpretation of "flight time" as defined in 14 CFR 1.1? I have found various interpretations of the FAA definition online and in different publications. Some, relating to, say it begins with the takeoff roll, while others suggest time of engine start, time of pulling away from the tie down, or tach at start is the correct starting point. Ending flight time has been described as: when the air switch activated Hobbs [meter] stops turning over, when the aircraft touches down, when the aircraft first comes to rest after exiting the runway, and when the aircraft stops and the engine is turned off at the hangar or tie down. So which is correct and can you clarify in the *FAA Safety Briefing*?

— John

Thank you for your question. We presented it to the Airmen Certification and Training Branch aviation safety inspectors and they returned with the following: 14 CFR part 1 definition of flight time means:"Pilot time that commences when an aircraft moves under its own power for the purpose of flight and ends when the aircraft comes to rest after landing"

This means that as soon as the aircraft moves under its own power for the purpose of flight, including taxi, it can be logged as flight time. This would also include taxi time after landing until the point when the aircraft comes to rest. This is also typically when the aircraft is parked and the flight is terminated. In addition, one must also conclude that, because the rule specifically mentions "comes to rest after landing," this will necessitate that the aircraft actually became airborne under its own power since one cannot land without becoming airborne first.

FAA acceptance of logging flight time in this manner is affirmed by designated pilot examiners and operation safety inspectors who securitize pilot records verifying aeronautical experience and training requirements for pilot certification, ratings, and privileges.

FAA Safety Briefing welcomes comments. We may edit letters for style and/or length. If we have more than one letter on a topic, we will select a representative letter to publish. Because of publishing schedule, responses may not appear for several issues. While we do not print anonymous letters, we will withhold names or send personal replies upon request. If you have a concern with an immediate FAA operational issue, contact your local Flight Standards District Office or air traffic facility. Send letters to: Editor, *FAA Safety Briefing*, AFS-850, 800 Independence Avenue, SW, Washington, DC 20591, or email SafetyBriefing@faa.gov.

Let us hear from you — comments, suggestions, and questions: email SafetyBriefing@faa.gov or use a smartphone QR reader to go "VFR-direct" to our mailbox.

SUSAN PARSON

Surviving the Shivering Season

My long-suffering family, friends, and colleagues have all acquired eye-rolling familiarity with the "Susan-hates-winter" grousing that erupts as predictably as the change of seasons each year. I grumble at wearing coats. I shiver pathetically in the icy winds. I don't find any beauty at all in that stuff called s-n-o-w — an ugly four-letter word that brings discomfort, danger, and all kinds of inconvenience.

I take hope in years when the venerable *Farmer's Almanac* predicts a mild winter. Just to be on the safe side, I dust off my annual "Petition to Abolish Winter" and badger people to sign on. Sadly, Mother Nature has so far refused to entertain weather petitions of any kind. But I am nothing if not persistent.

Winter wuss that I am, the opening "Fly, Flee, or Fold" article in this issue of *FAA Safety Briefing* had particular resonance with me. Since there may be kindred spirits out there, allow me to share thoughts and practices for each of the three options.

Fly

Winter weather makes me grumpy, but not flying makes me *really* grumpy. There was a time when I was like the proverbial postman: neither rain, nor snow, nor howling winds could keep me from my appointed rounds with whatever airplane I had arranged to fly that day. I have deeply ingrained memories of the numerous days when I suffered through painful preflight inspections, and shivered still more once aloft. As John Duncan notes in his "Jumpseat" department, GA aircraft heating arrangements — like those in the older models I mostly flew back then — are not very robust. The Starbucks outlet nearest my home airport made a fortune off my post-flight debriefing sessions.

No more. Even before I hit the half-century mark, I had already decided I was too old for unnecessary suffering. GA flying is supposed to be *fun* and, given how costly this particular brand of fun can be, I'm no longer willing to pay lots of money to be miserably uncomfortable. My solution is to keep a sharp lookout for winter days congenial to GA flying (i.e., clear, not too cold or windy) and schedule my flying accordingly.

Flee

My twist on flying south for the winter is to make frequent airline flights to the American southwest. Nothing makes me smile more broadly than marching off the Sky Harbor Airport jet bridge into the warm winter sunshine of my adopted home state, Arizona. One of the many advantages of Arizona is that "flee" and "fly" are not exclusive. On the contrary, the world-famous nice winter weather in the southwest makes it a mecca for flight training, and I've indulged in a variety of flying opportunities on my various visits. In addition to completing a standard aircraft checkout at the local flight school, I've used my Arizona time for sessions of highly-specialized flight training (e.g., upset recovery training and formation flight training). If you're among those who flee to a more congenial climate, check out the flight schools in warmer climates. You can use the time to keep your skills sharp, to explore new territory, and to learn new skills.

Fold

On those unpleasant winter days when I can't fly and I haven't made arrangements to flee, I cue the Kenny Rogers song about knowing when to fold 'em. But folding doesn't mean you have to sit by the television. On the contrary, dreary winter weather can offer great opportunities to sharpen the mental skills associated with flying. You can study for a new certificate or rating. You can refresh your knowledge of forgotten techniques and procedures. In my case, I (re)learn a lot from seasonal scans of publications like the *Instrument Procedures Handbook*, and there's no shortage of new material coming online — literally. You can take free courses for WINGS credit on FAASafety.gov, or the AOPA Air Safety Institute's website.

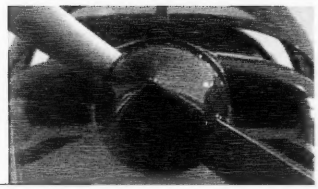
Another option for "folding" time is to "fly" an aviation training device. These sessions allow you to keep existing skills sharp, to learn new ones, and to practice abnormal and emergency situations in ways you could never safely accomplish in a real airplane.

Last, but not least, you can use the dreary weather "fold 'em" time to indulge in any of the many wonderful books about the art, science, poetry, and magic of our favorite activity. If you need a starter reading list, try anything by Anne Morrow Lindbergh, Richard Bach, Ernie Gann, Beryl Markham, and Antoine de St-Exupery. By the time you're done, we'll also be done with winter.

Susan Parson (susan.parson@faa.gov, or @avi8rix for Twitter fans) is editor of FAA Safety Briefing. *She is an active general aviation pilot and flight instructor.*

TOM HOFFMANN

FAA Faces



Mike Yorke

Aviation Safety Inspector and FAA Safety Team Representative

"Another day in paradise," says FAA Aviation Safety Inspector (ASI) Mike Yorke, while gazing at his Piper PA-18 *Cub* peacefully bobbing on Florence Lake just outside his Willow, Alaska, log cabin. "There's just something about Alaska," he says. "The remoteness and the vastness you see here is hard to match anywhere else. I could literally drive for two or three hours and only pass one restaurant. I love it."

It seems the lure of the Alaska wilderness is strong with Yorke, who has spent nearly his entire life working, flying, and raising a family in the 49th state. However, despite its many idyllic qualities, Alaska can also be very unforgiving, especially for aviators. That's significant because in Alaska, pilots ply the skies not just for recreation, but more often for their own livelihood. Winters in Alaska can be particularly challenging, with unpredictable weather, frigid temperatures, harsh icy landscapes, and of course, *very* little daylight. Some areas average a mere four hours of sun in the winter!

Realizing the many hazards airmen face in this area, Yorke has made it his mission during his 16-year FAA career to help keep pilots informed, aware, and most importantly, safe. During his last three years as an Operations ASI assigned to the FAA Safety Team, Yorke has accomplished this mission by traveling the state to host and/or participate in aviation safety seminars, as well as certificated flight instructor forums and meetings.

Working with the Anchorage FSDO, Yorke is also involved in a state-wide safety initiative known as GA Contacts, where inspectors introduce themselves to airmen and have a friendly face-to-face chat about general safety issues and answer any questions they may have. "For example," says Yorke, "if I notice someone who's concerned about weather in a remote area, I might ask them if they're familiar with the 213 live weather cams we have posted at airports, mountain passes, and other remote areas around Alaska." (If you want to have a look, go to http://avcams.faa.gov/.)

Yorke is proud of his work with GA Contacts and considers the program to be very successful in helping foster a healthy safety culture. The program has also proved instrumental during the state's biggest sporting event, the Iditarod Trail Sled Dog Race. In his small town of Willow, a popular re-start area for the race, Yorke recalls seeing as many as 150 airplanes flying in. "It can be a little challenging at times, but pilots are mainly appreciative of the information and guidance we can provide. I think face-to-face contact can get you much further down the road for safety."

Of course it helps to have some airplane street cred too, of which Yorke has plenty. In addition to flying Cessna *Skywagons*, and de Havilland *Beavers* for his own air taxi service earlier on in his career, Yorke also spent time as a Robinson R-44 check airman and was an inspector for 121 and 135 operators. And let's not forget his *Cub*, in which he's racked up 1,300 hours. With floats, three sets of skis, and tundra tires, it's equipped to land in just about anything Alaska can dish out.

Understandably, "being prepared" is one of the biggest safety mantras Yorke preaches among his fellow GA pilots, but it's also one of the areas he sees a lot of pilots fall short of recognizing. "Having all the proper equipment before a flight isn't always at the top of their minds," he says. "Things in Alaska can change fast so it's not something to take lightly." Among the items Yorke recommends having in your airplane in the winter include a good pair of snow boots (for warmth and packing down snow), rope, and an extra set of clothes in case you get wet. A shovel for skiplanes and a paddle for floatplanes are also good ideas.

As far as the long winter nights, Yorke admits there's not much you can do about that. "On the up side, we start gaining about six minutes a day of daylight in the spring," he says. At least that's one way of brightening your day.

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